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THE PERSEVERATING TENDENCY IN STUTTERERS IN A PERCEPTUAL FUNCTION

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AND
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The authors are concerned in this paper with the determination of the relationship between stuttering and the perseverating tendency in a perceptual task. Perseveration may be defined as the tendency of ideas to remount into consciousness spontaneously, once they have occurred. It is in effect a lag or inertia of chemico-neural processes. Jasper (1) defines perseveration as the tendency for a set of neurons, once excited, to persist in the original state of excitation autonomously, and to show resistance to any change in this state. Although various investigators, including Ewen (2) and Jasper (1) have been concerned with the perseverating tendency in the abnormal, the tendency should not be thought of as being peculiar to the abnormal. All of us perseverate at times. The recurrence of a tune or a jingle, the continued feeling of standing on roller skates after the skates have been removed, and the sailor's "sea legs" on shore are common examples of the perseverating tendency. In spite of the prevalence of this phenomenon, only Spearman (3) has given much attention to perseveration as a general personality trait. He maintains that perseveration increases along the lines "manic-normal-melancholic." He believes, and this is of interest to students of stuttering, that males show a greater tendency to perseverate than females.

More specifically, the authors would like to be able to answer the question as to whether the tendency of the stutterer to repeat a sound he has uttered, and his inability to proceed from one sound to another in the stream of speech might be manifestations of the perseverating tendency. The production of a speech sound results from the excitation of sets of neurons. If the original state of excitation were to continue autonomously, resisting change, the result would be either a repetition of the original sound produced, or, if the repetition of the sound is inhibited by the speaker, a blocking of further vocalized articulated speech.

Eisenson (4) has demonstrated the presence of the perseverating tendency in stutterers in sensori-motor tasks. The battery of tests included the writing of letters, the drawing of horizontal and vertical lines, and the addition and multiplication of one-place numbers. In all tests the thirty male normal speakers excelled the stutterers in their ability to adjust readily and rapidly to each

task, and, therefore, completed more work in the same length of time than did the stutterers. This strongly suggested the presence of a relationship between stuttering and the tendency for a pattern of reactions to perseverate.

The equipment for the present experiment consisted of seven cards prepared for tachistoscopic exposure. On each card were pasted little squares of various colors, the number of colors ranging from four on Card No. 1 progressively to nine on Card No. 7. Many duplications of a color appeared in the little squares on a card, so that the number of squares exceeded the number of colors. The cards were presented in order from No. 1 through No. 7 in a Whipple tachistoscope. The exposure time for each card was one-fifth of a second. The subjects were instructed to fixate the aperture of the tachistoscope when the experimenter gave the "Ready" signal, and then to observe carefully the number of different colors on the card, *not the number of squares*. Furthermore, they were directed to record immediately the names of all the colors they remembered. The subjects were given as much time as they needed to record their observations before the next card was presented. The colors were red, yellow, green, blue, orange, gray, white, brown, and black, presented in various numbers and combinations on the cards.

Two groups of subjects participated in the experiment, an experimental and a control. Each received the same directions as described above. The experimental group was composed of fifteen male stutterers, all students in Brooklyn College who were receiving remedial treatment in the Speech Clinic. The control group consisted of twenty male students from classes in psychology in the College, all of whom were normal speakers.

The quantitative results of the experiment appear in Table I. The indices applied to the data of the two groups are represented in the first column, the averages and Standard Deviations for the stutterers and the normal speakers in the second and third columns, respectively, and the reliability of the difference between the two groups in the fourth column.

It will be observed from the first array in Table I that the normal speakers on the average saw more colors than the stutterers, and were relatively more variable than the stutterers. The difference between the two groups in the number of colors seen closely approaches reliability (98 chances in 100 of a true difference).

The average difference between the number of colors reported seen and the number of names of colors recorded for each group is presented in the second array of Table I. It indicates that the stutterers tended to record more completely the names of the colors from the number they had seen than did the control subjects. The authors interpret this to mean that the stutterers were somewhat more tenacious in grasping the colors than were the normal speakers. The difference, however, is not reliable, due, no doubt, to the small number of subjects.

The third array of Table I shows that there was no difference between the stutterers and control subjects in the average number of omissions in colors recorded. The greater variability of the normal speakers is of interest, however.

It will be noted from the fourth array of Table I that the stutterers inserted the wrong names of colors in the records more frequently than did the controls, although it cannot be said that the difference is statistically reliable.

In order to determine whether stutterers tended to perseverate more in recording the names of colors than did normal speakers, the erroneous insertions were analyzed for this characteristic. The results obtained appear in the last array of Table I. The scores indicate the average number of times that the name of a color was erroneously recorded which had previously been presented on a card earlier in the series. The stutterers manifested this perseverating tendency considerably more than the normal speakers. The difference between the two groups is statistically reliable (100 chances in 100 of a true difference).

TABLE I

SHOWING THE RESULTS OBTAINED IN THE COMPARISON OF THE STUTTERERS WITH THE NORMAL SPEAKERS AS DETERMINED BY SEVERAL INDICES, AND THE RELIABILITY OF THE DIFFERENCES BETWEEN THE TWO GROUPS

Index	Stutterers	Normal Speakers	$\frac{D}{\sigma \text{ diff.}}$
Mean No. colors seen.....	28.20 ± 3.14 S. D.	33.00 ± 8.50 S. D.	2.03
Mean difference between No. colors seen and No. of names of colors recorded.....	1.73 ± 2.35 S. D.	2.58 ± 4.60 S. D.	.69
Mean No. omissions in recording colors.....	14.50 ± 3.33 S. D.	14.50 ± 5.62 S. D.	0
Mean No. erroneous insertions.	3.50 ± 2.00 S. D.	2.40 ± 5.45 S. D.	.83
Mean No. cases of perseveration of name of a color.....	2.00 ± 1.09 S. D.	1.05 ± .86 S. D.	2.80

From the above results the authors conclude that perseveration is at least one of the characteristics of stutterers which accounts for the phenomenon of stuttering. The stutterers continue to react to stimuli when the stimuli are no longer present, and cannot adjust themselves to changing situations so readily as normal speakers.

In general the results of this investigation of the perseverating tendency in a perceptual function are similar to those obtained by Eisenson (4) in the comparison of stutterers and normal speakers in the perseverating tendency in sensori-motor tasks. This fact strongly suggests that perseveration might be a general characteristic of the reactions of stutterers.

The authors would further conclude that stuttering is an indication of an inability on the part of the stutterer to adjust his speech organs quickly and easily to the production of the various sounds in the stream of speech. Stuttering is a manifestation of the perseverating tendency, which, at least in part, causes the stutterer to stutter as his normal way of speaking.

REFERENCES

(1) **H. H. Jasper,** "Is Perseveration a Functional Unit Participating in All Behavior Processes," Jo. Soc. Psych., **1931, 2,** 28–51.

(2) **J. H. Ewen,** "Perseveration in the Insane Epileptics," Jo. Mental Science, 1930, 76, 537–540.

(3) **C. E. Spearman,** "The Abilities of Man." New York, Macmillan Co., 1927, pp. 291–307.

(4) **J. Eisenson,** "A Study of the Perseverating Tendency in Stutterers," Quarterly Journal of Speech, Vol. XXII, No. 4, pp. 626–631.

BOOK REVIEWS

THE MATURATION OF CERTAIN VISUAL FUNCTIONS AND THE RELATIONSHIP BETWEEN THESE FUNCTIONS AND SUCCESS IN READING AND ARITHMETIC. By G. W. WAGNER. (in Tiffin—Studies in the Psychology of Reading). Princeton: *Psychological Monographs*, 48:108–136, 1937.

Ametropia (which tests hyperopia, myopia, and astigmatism), esophoria, fusion, and visual acuity are valuable tests to the reading clinician and are basically associated with poor reading. Wagner establishes norms for subjects from grade one to college freshmen for tests of fusion, amplitude of fusion, lateral imbalance, visual acuity, and stereopsis.

SOME PSYCHOLOGICAL FACTORS IN THE TREATMENT OF CLEFT-PALATE SPEECH. By J. H. VAN THAL. London: *Speech*, The Journal of the British Society of Speech Therapists, 2:7–10 (October) 1936.

Van Thal finds a concept of rhinolalia mixta in uraniscolalia cases demanding an aggregation of clausa and aperta. The psychological aspects of six specific cases as well as general psychological theory of the particular type of case is discussed. "It transpires therefore that in treating cleft-palate speech we are helping our patients to overcome a physical handicap, which may have been surgically or prosthetically treated with more or less success, but we must not forget that we are dealing with human beings who have an infinite variety of character, taste, and intelligence."

—C. H. V.

SPEECH REEDUCATION FOR THE BIRTH INJURED

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The problem of speech reeducation among children with motor disorders of the central nervous system is justly receiving increasing attention. Seven years ago the author started a study of the speech of children handicapped by cerebral palsy. This was carried out through observation and systematic recording of findings. Over one hundred cases of speech defects were observed. The majority were under observation the greater share of the seven years. Fifty-four cases of defective speech were finally chosen for report. The criteria for selection were (1) the case must be diagnosed as spastic; (2) the case history must be sufficiently inclusive to warrant its use. Believing that some insight might be gained by including a number of cases of spastics with good speech, nineteen such cases were chosen by the same criteria mentioned above. The results of that study[1] are offered here as tentative evidence of the factors involved in the treatment for spastic speech. The author has recognized that more detailed neurological diagnoses would separate cases of extra-pyramidal motor system disease, cerebellar involvement, etc. That study is now under way.

The data assembled in the original study includes (1) family history as far back as obtainable, (2) individual history from inter-uterine stage to date of history taking, (3) therapies used including physical, speech, occupational and physio-therapy and (4) speech results. The information was worked up under the following headings:

1. Physical diagnoses.
2. Speech diagnoses.
3. Chronological age.
4. Sex.
5. Birth History.
6. Developmental History.
7. Family History, particularly laterality.
8. School History, including I. Q.
9. Laterality History.
10. Treatments of all kinds.
11. Speech Progress.

[1]Unpublished Master Thesis, "Speech Therapy for Spastics. A Case Study Analysis of 73 Cases." B. R. Rutherford, U. of Minn., 1937.

The factors involved in this study include:

1. Distribution of cases according to sex and type.
2. Laterality, especially shifts in handedness.
3. Heredity.
4. Ordinal Position.
5. Intelligence.
6. Age of onset of speech and age of onset of stuttering.
7. Therapies.

Tentative evidence of the relative significance of these factors is revealed in a series of tables. A summary of this evidence follows in toto.

1. Distribution of Speech Groups.

Approximately 24% of the defective speech group in this study are stutterers. In the Annual State Report[2] of the Minneapolis Public Schools for 1936–37, approximately 13% are stutterers. The entire number of speech-defectives in this State report is 2,171; the stutterers number 289. This difference in per cent (24% vs. 13%) may be significant even though the disparity between the numbers reported (54 vs. 2,171) is great.

Dysarthria is found in this study in a ratio of 2 to 1 with dysphemia. This ratio may also be affected by the small numbers.

It may be significant that there is an even sex distribution in the defective-speech group of this study. The good-speech group does not have this 50–50 ratio. It is generally recognized by teachers of speech correction that the stuttering is greater among males than among females. This study of spastics reveals a 2 to 1 ratio of males to females. Bryngelson[3] found a 3 to 1 ratio of males to females. The factor of numbers may be partially responsible for this discrepancy. In the Bryngelson study there are 322 males and 148 females between the ages of four and sixteen years. The study being reported includes 11 males and 5 female stutterers between the ages of five and sixteen years. Sex may be a neutral factor in this study of spastic speech.

2. Laterality.

A study of the tables on handedness reveals that a definite factor (hemiplegia) contributes to the hand preference in approximately 36% of the cases. The fact that one side is crippled and the other is not is part of the reason for hand preference. The left hemiplegias use the right hand and the right hemiplegias use the left hand. With the diplegia group, which constitutes the bulk of the speech-defective cases, hand preference is not so evident.

[2]These figures are taken from the 1936–37 Annual State Report of the Speech Department of the Board of Education, Minneapolis, Minnesota.

[3]Bryngelson, Bryng. "Sidedness as an Etiological Factor in Stuttering." *Journal of Genetic Psychology*, (1935), pp. 47, 204–217.

Shifts in handedness before entrance to school occurred in only one of the good-speech groups. In the defective-speech group it occurred in two cases, both dysphemia. In two cases, both dysarthrias, the right side was definitely trained from infancy on. Shifts in handedness with no known influence have occurred in four of the defective-speech group: (1) Case 35 shifted from left hand to right hand. Speech improvement was greater subsequent to the shift than previous to it. (2) Case 41 shifted from right hand to left hand, back to right, and back again to the left with a regression in speech ability. Finally he returned to the right hand. Since then his speech has improved. (3) Case 45, trained to the right, used his left hand in school for a year and then shifted back to his right. His speech improved but little. (4) Case 54 was ambidextrous when she came to school. She chose to use the left hand. During the period of using her left hand her speech was corrected. Subsequently, she had sickness and operations. Following each operation and a severe illness she shifted handedness, left to right, right to left, left to right—with no apparent effect upon her speech.

Of twelve cases shifted in handedness after entrance to speech class, the speech of four cases was corrected; the speech of four showed great improvement; that of three showed lesser improvement; and that of one appears to be no worse nor any better. Of these twelve shifts, seven were from the left to the right hand. Four of the seven were right hemiplegias. This meant, of course, a shift to the crippled or more crippled hand. Dysphemia was eliminated in three of the four cases; the fourth shows no change either way.

Nine, or approximately 16%, of the defective-speech cases reveal a stutter or an increase in stuttering when the crippled or more crippled hand is given physical treatment; and also reveal an elimination of dysphemia when that treatment is discontinued. Three cases, or 16% of the good-speech group, reveal in the infancy history a tendency to stutter when the crippled or more crippled hand was exercised or the preferred hand inhibited. Dysphemia was eliminated when the exercise or inhibition was discontinued. These cases seem to indicate that there is a relation between sidedness and speech.

Eyedness is another factor in laterality. Approximately 57% of the defective-speech group, excluding the seven for whom eyedness tests could not be given, are left eyed; and approximately 60% of the good-speech cases are left-eyed. This difference does not seem to be a significant one.

3. Heredity.

Four items are considered in heredity:

1. dysphemia.
b. ambidexterity or left handedness.
c. strabismus or twinning.
d. reading, writing or other speech disabilities.

Among the spastic speech groups in this study, the following distributions of these items are found:

a. 5% of the 16 Cases in the dysphemia group have dysphemia in heredity.
   18% of the 34 Cases in the dysarthria group have dysphemia in the heredity.
   42% of the 19 Cases in the good-speech group have dysphemia in the heredity.

b. 63% of the dysphemia group have ambidexterity or left handedness in the heredity.
   70% of the dysarthria group have ambidexterity or left handedness in the heredity.
   74% of the good-speech group have ambidexterity or left handedness in the heredity.

c. 38% of the dysphemia group have strabismus or twinning in the heredity.
   26% of the dysarthria group have strabismus or twinning in the heredity.
   16% of the good-speech group have strabismus or twinning in the heredity.

d. 25% of the dysphemia group have reading, writing or other speech disabilities.
   18% of the dysarthria group have reading, writing or other speech disabilities.
   16% of the good-speech group have reading, writing or other speech disabilities.

Only one case (Case 59, good-speech) has all four items represented. Seven cases (all defective-speech) have none of the items represented; 43% of these are stutterers.

There is a large amount of ambidexterity and left handedness in all groups. It is interesting to note that the good-speech group has a larger, though not a significantly larger, per cent than the dysphemia group. It is also interesting to observe that the per cent of dysphemia in the heredity of the good-speech group is significantly larger than the per cent of dysphemia in the heredity in the dysphemia group.

These results do not agree with a study of Bryngelson and Rutherford.[4] In this study 18% of the non-stutterers and 46% of the stutterers had a heredity of stuttering; while 74% of the stutterers and 63% of the non-stutterers had a heredity of left handedness. The cases in the above study, however, are physically normal.

The per cent of strabismus and twinning in the dysphemia group is over twice the per cent of the heredity of the good-speech group.

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[4]Bryngelson and Rutherford. "A Comparative Study of Laterality of Stutterers and Non-stutterers." *Journal of Speech Disorders*, March, 1937.

Ambidexterity, left handedness, twinning, and strabismus appear in the heredity of the two defective-speech groups in greater per cent than either dysphemia or other speech, reading or writing disabilities; while in the good-speech group the per cent of dysphemia, ambidexterity and left handedness in the heredity is greater.

One factor which does not show in the tables which should be taken into account is the factor of the lesion in the central nervous system which accounts for the physical crippled condition. If the presence of a lesion is the principal factor in the etiology of spastic speech then heredity may not be so important a factor, and the differences in the items in this study and the Bryngelson-Rutherford study may not be true differences.

4. Ordinal Position.

The cases of defective-speech seem to be very slightly more apt to be first children (33% to 26%) and less apt to be middle children than are good-speech children, according to this study. The chances seem to be 50–50 that either may be only children. Defective-speech cases show 26% as last children while the good-speech group shows 16% as last children. In this study, 21% of the good-speech group were in some ordinal position other than first, last or middle, while only 6% of the defective-speech were in some other ordinal position.

5. Intelligence.

The median I. Q. for the defective-speech group is higher (I. Q. 94) than the good-speech group (I. Q. 89.3). The dyslalia group has the highest median I. Q. (96.6) among the defective-speech group; and the dysphemia group has the lowest (I. Q. 86). Seventy-five per cent of the dysphemias, 19% of the dysarthrias, 75% of the dyslalias and 42% of the good-speech group reached or exceeded the median I. Q. of the defective-speech group. Forty-two per cent of the dysphemias, 50% of the dysarthrias and 100% of the dyslalias reached or exceeded the median I. Q. of the good-speech group. Fifty per cent of the entire defective-speech group reach or exceed the median I. Q. of the good-speech group. The dysarthria group has the widest range of I. Q. scores (58 to 106).

It seems significant that the group which seems to be the most difficult to obtain relatively definite I. Q. scores is the group that has significantly smaller per cent of scores reaching or exceeding the median I. Q. of the good-speech group. It may be that speech rather than intelligence is the significant factor involved in the low score.

6. Onset of Speech.

Onset of speech before two years of age is found in approximately: 62% of the dysphemia group, 20% of the dysarthria group, and 80% of the good-speech group.

The onset of speech is relatively earlier among the good-speech group as well as more frequently before two years of age than among the defective-speech group. The range of age of onset of speech is greater, however, among the dysarthria-diplegia group. It seems significant that in the good-speech group the per cent of the onset of speech before two years is four times that of the dysarthria group. That the per cent of onset before two years of age in the dysphemia group is three times as great as in the dysarthria and only two-thirds as great as the good-speech group may also be significant.

The tables also reveal that the onset of dysphemia is more frequent between the two age levels 1 to 2 years and 5 to 6 years. Bryngelson's study of 700 stutterers reveals that in 40.57% the onset is between 2–4 years, and in 50.14% the onset is between 5–7 years.

7. Therapies.

Mental Hygiene was used as part of the speech therapy for all defective-speech cases. All of the dysarthrias and dyslalias were given exercises of tongue, lip, jaw and throat muscles. Fifty-eight per cent of the dysphemia group were given this type of treatment also. These were the dysphemias who also had dysarthria. All of the dyslalia and 94% of the dysarthrias received auditory stimulation, and 68% of the dysarthrias took exercises for breath control. The trend of this group then is toward limbering of speech musculature and establishing correct auditory patterns, plus the setting up of healthy mental attitudes. The trend for the dysphemias, besides the setting up of healthy mental attitudes, is towards unification of motor leads.

The trend of physical therapies is toward co-ordination in all groups. Fifty-six per cent of the dysphemias receive corrective walking, and 56% receive occupational therapy, but only 20% receive games. That only 20% of both dysphemia and dysarthria groups receive games is explained partially by the fact that many of these two groups are unable to participate physically in any of the group games. They participate socially but not physically. Some of them are given individual games in their occupational therapy period. That there are not more constant factors in the therapies used for these children indicate the individuality of treatment.

Speech progress is determined:

(1) In dysphemia by the difference in ability to speak rhythmically and the frequency with which rhythmic speech is heard.

(2) In dysarthrias by ability to control breathing, and the extent to which speech-sounds are accurately used in conversation.

(3) In dyslalias speech progress is determined by the extent to which speech-sounds are accurately used in conversation.

Improved indicates all degrees better than a little improved up to corrected. Seventy-five per cent of the dyslalias were corrected as

compared with 12% of the dysarthrias and 25% of the dysphemias. The speech of 11% of the males was corrected as compared with 30% of the females. The same per cent (63%) of males and females are in the improved group. Of the right hemiplegia group 39% were improved as compared with 70% of the diplegia and 67% of the paraplegia group. Fifty-four per cent of the right hemiplegias were corrected compared with 7% that were little improved. In all the groups, speech was corrected in 20% of the cases, improved in 63% of the cases, and little improved in 16% of the cases. The trend seems to be toward improvement. A different distribution of results may be found if some studies were made using certain of the items in the therapies on certain cases, etc.

The following conclusions may be drawn:

1. Incidence of stuttering is relatively twice as great among this group of spastics as among the 1936–37 defective-speech classes in the Minneapolis Public Schools.

2. Sex ratio among dysphemias is slightly smaller (2 to 1) in this study of spastic-speech than in a study of physically normal children of comparable age by Bryngelson (3 to 1).

3. The crippled condition is an evident contributing factor in determining hand preference in hemiplegias.

4. The crippled condition is a less evident contributing factor in determining hand preference in diplegias.

5. Shift of handedness does not seem to guarantee cessation of dysphemia in all cases.

6. Shift of handedness seems to be the precipitating cause of dysphemia in some cases.

7. Shift of handedness seems to be a decisive factor in eliminating some cases of dysphemia.

8. Shift of handedness seems to contribute to the increase and decrease of dysarthria.

9. Shift of handedness seems to have had no effect upon some cases of established good speech in this study.

10. The good-speech group has a larger proportion of dysphemia, ambidexterity, and left handedness in the heredity than either the dysphemia or dysarthria groups.

11. The dysphemia group has a larger proportion of strabismus, twinning, reading, writing, and other speech disabilities than either dysarthria or good-speech groups.

12. If the lesion responsible for the crippled physical condition is responsible for the speech defect then heredity seems to be a factor of lesser importance.

13. Speech defective spastics seem to be more frequently first or last children than in any other ordinal position.

14. I. Q. range is wider, in this study, among defective-speech spastics than among good-speech spastics.

15. Median I. Q. for the defective-speech group (94) is higher than for the good-speech group (89.3).

16. The age of onset of speech is relatively earlier among good-speech spastics than among the defective-speech spastics.

17. The age of onset of speech among the good-speech group is more frequently before two years of age than it is among the defective-speech group.

18. The onset of stuttering age distribution seems to be bimodal.

19. The trend of the speech treatment for dysarthrias in this study was toward establishment of accurate auditory patterns of speech-sounds and the establishment and maintenance of a healthy mental attitude.

20. The trend of the speech treatment for dysphemia in this study was toward unification of motor leads on the natively dominant side, and the establishment and maintenance of a healthy mental attitude.

21. Dyslalias tend to be corrected more frequently than dysarthrias or dysphemias.

22. Females tend to be corrected more frequently than males.

23. The per cent of corrections is greater in the diplegia group than in the paraplegia or right hemiplegia group.

24. Speech therapy for defective speech among spastics seems to be of an individualistic nature.

25. There is a need for controlled studies to discover the relative effectiveness of items of therapy for the correction of defective speech among spastics.

BOOK REVIEW

CORRECTION OF SPEECH DEFECTS OF EARLY CHILDHOOD. By ROBBINS AND ROBBINS. Expression Company, Boston, Mass., 1937.

A book covering the causes of speech defects, including mental deficiency, deafness, structural anomaly, paralysis or weakness of speech muscles, poor sound discrimination, short auditory memory span, imitation and hyperemotionality. Followed by correction of the more common speech defects and instructions for the correcting mispronunciation. This is followed by tests for mispronounced sounds and corrective exercises.

A good exercise book for improving sound discrimination and well worked up throughout.

S. STINCHFIELD-HAWK, U. of So. Cal.

FREQUENCY OF STUTTERING WITH ANTICIPATION OF STUTTERING CONTROLLED

ROBERT MILISEN, PH. D.
Indiana University

Research workers in speech pathology have observed many differences between stutterers and normal speakers. Among the most important of these differences is the tendency which adult stutterers have of looking ahead and picking out "feared" or "stuttering" words (anticipation of stuttering). The normal speaker may look ahead, but this will not be in relation to fear of attempting certain words.

This anticipation gives the stutterer subjective evidence of the emotional basis of his stuttering. Many times he has anticipated stuttering on a word, and then when he attempted to say it, he did stutter. This temporal series has occurred so many times in the adult stutterer's experience that he assumes a direct cause-and-effect relationship between the anticipation of stuttering and the onset of the spasm. He says that he knows not only when he will stutter but also that he will stutter every time he expects to. If these subjective judgments of stutterers are correct, then a theory would be most tenable which postulates that stuttering is basically an emotional instability with a fixation on the speech mechanism.

Some experimenters, notably Johnson (1), Van Riper (4), Knott (2), and Milison (3), have shown the importance of anticipation to stuttering. In general, the more the adult stutterer anticipates stuttering, the more likely he is to stutter. All experimenters are agreed on the fact that stutterers do not always stutter perceptibly each time they anticipate stuttering. On the other hand, there is disagreement as to the amount of stuttering which can be successfully predicted.

Johnson and Sinn (1) studied anticipation in the following manner: A 1,000 word selection was used. In the first reading the stutterer was instructed to read as well as he could, and the experimenter recorded each spasm which was observed. In the second reading the stutterer was instructed to read carefully and to stop, signal to the experimenter, and leave out any word he was not sure he could say without stuttering. All spasms observed by the experimenter were recorded and the stutterer's introspections were taken. In reading number three and successive readings the procedure was the same as in the second reading; the number of readings per subject ranged from two to seven. The results appear to be exceedingly clear cut. Only 0.16 per cent of the unanticipated words were stuttered.

A study similar to the Johnson, Sinn study was conducted by Knott, Johnson, and Webster (2). They reported that in a group of "sophisticated" subjects only 0.4 per cent of the unanticipated words were stuttered, and in the second group (naive stutterers) 3.0 per cent of the unanticipated words were stuttered. In the last study unanticipated spasms were 3 to 19 times as frequent as in the first study (Johnson, Sinn). It must be observed that the procedure was different in the two studies. In both the Johnson, Sinn and the Knott, Johnson, and Webster studies, however, the number of unanticipated words which were spoken normally was always compared with the number of unanticipated words which were stuttered, and the experimenters found the percentage of unanticipated spasms exceedingly small.

One may look at the problem from another angle. We are primarily interested in the stuttering itself because therein lies the speech defect; hence we should wish to determine what percentage of the spasms are anticipated. This can be done by dividing the number of unanticipated spasms by the total number of spasms both anticipated and unanticipated.

With the data given by Johnson and Sinn this method of analysis cannot be used, but a study of the results of Knott, Johnson, and Webster in this fashion shows that in the first group of stutterers 12 per cent of the spasms were unanticipated and in the second group of stutterers 6.7 per cent of the spasms were unanticipated.

Van Riper (4) also studied the relationship between anticipation of stuttering and its occurrence. In his procedure the stutterer sat before an exposure box in which single words were presented. As soon as he saw the word, he was to press a key to his right if he expected to stutter on the word and a key to his left if he did not expect stuttering. He found that 6.6 per cent of the spasms were unanticipated.

Milison (3) conducted a study using both non-contextual and contextual material. It was found that 13 per cent of the spasms were not anticipated when the non-contextual material was used, and 23 per cent of the spasms were unanticipated when the contextual material was used.

The results of these experiments conflict somewhat as to the percentage of spasms which may be predicted. The purpose of this experiment was to determine how successfully stutterers can predict their stuttering.

Twenty-six stutterers (22 males and 4 females) from the speech clinic at the University of Iowa acted as subjects in this experiment. They ranged in age from 16 to 34 years.

Procedure

Reading I. The stutterer was instructed to read carefully and to anticipate, signal to the examiner, and leave out all words which he did not feel sure he could say without stuttering. Both he and the

experimenter determined such spasms as occurred during the reading.[1]

Reading II. The stutterer was instructed to read at his normal pace but to pay no attention to anticipation. He was to stop each time he thought he had stuttered and signal the experimenter.

Reading III. The stutterer was to follow the instructions used in Reading I except that he was to signal each time he anticipated stuttering and then to go ahead and say the word. He was also instructed to stop after every spasm and signal to the experimenter that he had had a spasm.

To eliminate several factors which might influence anticipation of stuttering, the following special precautions were taken in the procedure and experimental technique.

Precautions Dealing with Procedure

1. Reading I was new material for the stutterers. Therefore, the stutterer's ability to predict his spasms as determined in this reading would be more consistent with the average speech situation, and hence his ability to anticipate spasms would not be facilitated by the artificial condition of pre-reading.

2. The same control affects the situation adjustment. The stutterer had to make the usual situation adjustment on Reading I while the anticipation of stuttering was being studied.

3. Van Riper and Hull (5) have shown that a general reduction in spasm frequency occurs from the first to the second reading of a given selection. If one uses the second reading of a series to study the effect of a certain phenomenon on the reduction of the number of spasms, he must take this fact into consideration. Since in this study the effect of anticipation acted on the first reading, this general reduction need not be taken into account.

4. Stutterers often become upset after having a spasm. As a result they stutter on a number of the words following the spasm. The elimination of one spasm in Reading I, therefore, may cause a decrease of more than one in the total number of spasms. The

[1]Reading I. The instructions to the stutterer were as follows: Read this selection to me. Read slowly in order that you may analyze each word and tell whether you expect to stutter on it. If you have the slightest doubt as to your ability to say any word, lift your finger and I will underline the word and you will not say it. I want you to be willing to leave out words; in fact, I would rather have you leave out every word than to try to say one which you are not certain you can say without stuttering. Once you decide you can say a word, go ahead and finish it regardless of what happens. If you have any stuttering when you say the word, stop and signal to me. If you don't stop when I think you might have stuttered, I will stop you and ask about the word. If you are sure you did stutter, admit it. If you are not sure or think you didn't, say no. Don't let me fool you when I stop you because I may ask you about a word which I'm sure you didn't stutter on, and if you say you did stutter, I will throw your records out of the experiment because you are unreliable.

If this procedure was not clear, further discussion took place until the stutterer understood what was expected of him. All three readings were read in order and on the same day. The selection used contained 996 words.

influence of this "spasm-breeding spasm" phenomenon on the stutterer's ability to predict his spasms was checked in Reading III. In this reading, it will be recalled, the stutterer not only signaled when he thought that he might stutter, but he also attempted the word immediately after the signal, thus adding a number of spasms to the reading which could not occur in Reading I of this study.

Precautions Dealing with Experimental Technique

1. To make a more accurate quantitative measure of the number of spasms, the judgment of the stutterer was combined with that of the experimenter in determining the words which were stuttered. When both the stutterer and the experimenter thought a spasm had occurred, the word was marked, and in this way even short interruptions were not ignored. On the other hand, if any doubt existed concerning the occurrence of a spasm, the word was not checked. (Even this procedure is inadequate if one wishes to make absolute quantitative judgments of stuttering, but it is felt that a larger number of the spasms will be checked by this method than by single observation, since the stutterer is often aware of slight spasms which are difficult for an observer to detect.)[2]

2. Since this experiment is dependent on the subjective judgment of the stutterer regarding his anticipation of stuttering, it seemed desirable to determine whether the stutterer was constantly trying to anticipate his spasms. The shock as an artificial motivation was used. The stutterer was told that we thought he had been lax in his efforts to anticipate his spasms in the first experiment and that therefore he would receive a shock every time he stuttered when he did not predict the spasm. His only way to avoid being shocked was to avoid all stuttering by leaving out words which might be stuttered.

The intensity of the shock was tested first by the experimenter until it was strong enough to provide punishment for him. The stutterer then took a preliminary shock as a test for its punishment value, and if the intensity was not great enough, an adjustment was made until the stutterer showed a strong tendency to withdraw or avoid being shocked. The inductorium was set up still further in the presence of the stutterer as a final precaution to be sure that the stutterer would fear the shock.

The same experimental technique was followed as in the main experiment. A new selection of 1,000 words was used.

Results

1. Since the primary interest of this study is the relation of anticipation to stuttering, it seems pertinent to state at the outset

[2]It should be pointed out that in the study by Knott, Johnson, and Webster, two observers recorded the stutterer's signaled expectancies and his stuttered words, and that only those signals and spasms upon which both observers agreed were tabulated. They did not, however, systematically call for the stutterer's own judgments in these matters, even though in some instances, at least, the stutterer did volunteer his judgments.

that 25 of the 26 stutterers studied reported three or more unanticipated spasms, whereas the results in the Johnson, Sinn study indicated that 13 of the 28 stutterers had unanticipated spasms.

2. Percentage of unanticipated words stuttered:

Reading I—Of 22,556 words read and not anticipated, 1.5 per cent were stuttered. This can be compared directly with 0.16 per cent reported by Johnson and Sinn and with 0.4 per cent and 3.0 per cent reported by Knott, Johnson and Webster.

Reading II—Of the same words (22,556) not anticipated in Reading I, 3.16 per cent were stuttered when spoken in Reading II. This result cannot be directly compared with data from any of the previous studies.

Reading III—Of 23,231 words read and not anticipated, 1.77 per cent were stuttered. This is comparable to the figures from previous studies cited in connection with "Reading I" above.

These results indicate that even though stuttering is not anticipated, that stuttering may occur frequently enough to make unanticipated spasms an important consideration for both the clinician and the theorist.

3. Percentage of stuttering not anticipated:

Reading I—3,679 words were either anticipated or stuttered and of these words 9.2 per cent were unanticipated spasms. This may be compared with .3 per cent in the study by Johnson and Sinn.[3]

Reading II—Of 2,297 stuttered words in Reading II, 30 per cent were not coincident with anticipations in Reading I. This cannot be compared with data from the previous studies.

Reading III—Of 2,673 words stuttered, 15.4 per cent were not anticipated. This can be compared with 12.2 per cent (sophisticated subjects) and 5.9 per cent (naïve subjects) in the study by Knott, Johnson and Webster.

These results indicate that the ratio of unanticipated spasms to anticipated spasms is large enough to demand explanation by any theory of stuttering and consideration in any therapy for the disorder.

4. Since we are interested primarily in the performance of the individual stutterer, the following data give the percentage of each stutterer's spasms which were unanticipated. This statistical approach is offered to modify Results 3 and to give a detailed picture of anticipation in each case, Results 3 permit four or five severe stutterers to have more influence in the final results than all the other cases put together.

These results are drawn from Reading III since in this reading all words were read, and the anticipations and spasms were recorded.

[3]In order to obtain these comparisons we assumed that every word anticipated (3,340) would have been stuttered if the stutterer had said it. These words were added to the number of unanticipated spasms (339) to give the total possible spasms in Reading I (3,679). A distribution of percentages from these data would be skewed in the direction of anticipated spasms, but for purposes of comparison, these data are presented.

(In Reading I all the words were not read and in Reading II anticipations were not recorded.)

Reading III. Six stutterers were unable to anticipate any of their spasms, and two stutterers were able to anticipate all of their spasms. All of these eight cases were relatively mild stutterers; hence it does not appear that the ability to anticipate spasms is necessarily a function of the severity of stuttering.

The frequency distribution of the percentage of each stutterer's spasms which were unanticipated yields the following results:

Range	100 %
Median	39 %
Q_3	96 %
Q_1	6.2%
Mean	48 %

These data bring forth one important fact. The median stutterer in this study was unable to anticipate more than 61 per cent of his spasms.

5. Percentage of anticipated words stuttered:

Reading II—Forty-eight per cent of the 3,340 words anticipated in Reading I were stuttered in Reading II. (Although the subjects did not indicate their anticipations in Reading II, we can use the words which were anticipated in Reading I and spoken in Reading II. In this way we can study the perseveration of anticipation.)

Reading III—Eighty-five per cent of 2,865 anticipated words were stuttered. This may be compared with 94 per cent of certainly anticipated words and 71 per cent of doubtfully anticipated words (sophisticated subjects), and 96 per cent of certainly anticipated words and 79 per cent of doubtfully anticipated words (naïve subjects) in the study by Knott, Johnson, and Webster.

These data show that a number of anticipations are not followed by spasms and that anticipations are more likely to be followed by stuttering if the word is said soon after the anticipation than if the anticipated word is spoken some time later.

6. Percentage of each stutterer's anticipations followed by stuttering. This statistical treatment gives each stutterer's data equal representation in the final results.

Reading III. These data include the scores of 21 stutterers. (Five of the 26 stutterers studied did not have any anticipations in Reading III.) The frequency distribution of the percentage of each stutterer's anticipations which were followed by stuttering yield these results:

Range	2.3–99.4%
Median	50.0%
Q_3	96.5%
Q_1	42.0%
Mean	61.4%

These data indicate that the median stutterer stutters only half of the time he expects to stutter.

7. Percentage of the unanticipated spasms occurring in Reading III on words which were neither anticipated nor stuttered in Reading I or stuttered in Reading II.

Of the 412 unanticipated spasms in Reading III, 52 per cent of the words were unanticipated and spoken normally in the first two readings.

For each case the total number of unanticipated spasms in Reading III was divided into the number of unanticipated spasms which were not anticipated or stuttered in Readings I and II. The median of these percentages was 62.5 per cent. In other words, 62.5 per cent of the unanticipated spasms of the median stutterer in Reading III were on words which were neither anticipated nor stuttered in two previous readings.

8. Were the stutterers unable to anticipate all their spasms or could their failure to anticipate some spasms be accounted for by a laxity in their anticipatory efforts?

One can not answer this question directly since anticipation is dependent upon the stutterer's introspective report. However, by the addition of a painful stimulus we have attempted to eliminate any laxity of anticipation by administering a shock to the stutterer for every unanticipated spasm. The methods used in this control experiment were discussed under *Procedure*.

Five stutterers were used who recorded unanticipated spasms during the progress of the first experiment. A small number of cases was used since the experiment was painful to the stutterer and since the problem presented is a qualitative one.

All stutterers tested had unanticipated spasms in both Readings I and III in this control experiment. One case has more unanticipated spasms in this experiment than in the original experiment whereas four had fewer unanticipated spasms. After thorough examination of the data, however, it appears impossible to interpret the data in any way which will throw light on the preceding experiment, excepting to say the stutterers had unanticipated spasms when we were sure they were trying to anticipate.

Conclusions

1. Ninety-seven per cent of the stutterers in this study were unable to predict all of their spasms.

2. The median stutterer was unable to predict more than 61 per cent of his spasms.

3. Stutterers are more likely to stutter when they anticipate stuttering than when they do not anticipate it.

4. Most stutterers do not stutter every time they expect to.

5. The occurrence of spasms seems to precipitate an increase in spasm frequency.

6. There is no doubt that psychological factors are very important to the process of stuttering. On the other hand, before a purely

psychological basis for stuttering can be accepted, it must be explained why stutterers do not stutter each time they fear or anticipate stuttering and why they often stutter when there is no anticipation of stuttering.

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BOOK REVIEW

THE CORRECTION OF DEFECTIVE CONSONANT SOUNDS. By NEMOY-DAVIS. Expression Company, Boston, Mass., 1937.

The authors have summarized the principles involved in the production of all of the consonants as listed by the International Phonetic Association in their Alphabet of English sounds. The teacher is supplied with abundant material for ear training, representing variety and continuity. Pedagogic methods are presented for the speech re-education of the average child or the one who is somewhat backward in speech development, and the exercises may well be applied to the dull-normal and backward child of certain levels of intelligence. The authors have arranged graded materials, have observed principles of habit formation and motivation in the selection of material, and they stress the application of these principles to their work, in their description.

There is a good bibliography and index, and the volume has been developed as a result of actual classroom experience and extensive speech training on the part of the authors. It should prove especially useful to workers in speech correction in the public schools.

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COURSES IN SPEECH PATHOLOGY AND CORRECTION IN THE AMERICAN MEDICAL COLLEGES

SIDNEY M. WEISSMAN

Preface

"Surveys of school children," stated the White House Conference, "report from 2.4% to 13% of the children with defects of speech."[1] The wide disparity, probably due, among other things, to the lack of adequately trained clinicians to administer the necessary tests, shown in the available statistics on speech defectives, indicates the unreliability of the results. Even the few comprehensive studies show considerable incidence-percentage differences. The St. Louis Board of Education made a speech survey in 1915–16 including 98,057 children, in which it was found that 2.8% were speech defectives. A similar survey by Conradi, made for 87,440 children in several American cities, showed 2.46% to be speech defect cases. A slight change is seen in a study by Stinchfield in 1922, of all the public elementary schools in Madison, Wisconsin, where she found 18% of the children to have speech difficulties. Tests conducted at Mt. Holyoke College over a period of six years bring somewhat similar results; namely, an average of 16% of the class each year received corrective treatment in speech.

In spite of these startlingly high percentages of the relative frequency of speech difficulties, the problems existing in the field of speech have until recently been almost entirely neglected by doctors and educators alike. In this country the focusing of attention on speech correction has been especially delayed and spasmodic. Notable efforts in the field of remedial speech work were, during the initial phases of the development of "speech-interest," the result of the labors of interested but isolated individuals. Scripture, in 1912, said, "It would be difficult to find a group of people more neglected by medicine and pedagogy than that of stutterers and lispers."[2]

Recent years, however, show an awakening interest in this vital problem. Experiment and research in speech, now recognized as one of the major components of social personality, proceeding under the combined stimulus of common interest and felt need, are progressing with accelerated momentum.

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[1]White House Conference on Child Health and Protection, 1932. Century Co., New York. Report of the Committee on Growth and Development of the Child. Part IV, Page 127.

[2]*Stuttering and Lisping*, by E. W. Scripture. 1912. Macmillan Company, New York. Page v.

Mushrooming out of previously barren ground comes an epidemic of speech clinics, established both as private practices and as academic, educational facilities. In many of the larger cities we already find great numbers of teachers employed exclusively for speech correction work, often with clinical facilities, medical advice, and psychological service available.

Educators and psychologists, realizing now as never before the integral relationship between speech and personality have, by their insistent probing, occasioned a flood of attention to the field of speech pathology. There has resulted a steady stream of significant experiments and publications which have greatly enriched the existing store of knowledge on the subject.

Two exemplary manifestations of this period of expansion are first, the founding of the American Speech Correction Association; and, second, in 1936, the inauguration of the Journal of Speech Disorders.[3]

Speech education, although admittedly still in its formative stages, is undergoing a very rapid growth, and that which scientific research has done for medicine and industry it is already doing for speech. But this growth is, for the most part, centered in private clinics and academic colleges. Evidently the medical profession, to which the speech pathologist must constantly turn for aid and information, has been unaware of the increasing need of physicians as speech consultants.

Most of the current views of Speech Therapy highly recommend, as an invaluable aid in this work, the services of medical men well acquainted with the relationships existing between medicine and speech.

The obviously logical training-ground for these much-needed experts is the medical college.

What is the American medical college doing to solve this problem?

This question was first brought to the writer's attention by James F. Bender, Director of Speech Clinic at Queens College, for whose patient supervision and expert guidance we are deeply grateful.

Introduction

In 1934, a survey by James F. Bender revealed that only 7 out of 167 hospitals in New York City gave attention to speech disorders. All seven provided diagnostic services, whereas only two offered rehabilitation programs.

Because of the inadequate facilities for speech rehabilitation found in the hospitals in New York City, as disclosed by that survey, it was decided to determine how much attention is given to speech pathology in the country's medical colleges.

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[3] *Speech Correction Principles and Practices*, by Bender, James F., and Kleinfeld, Victor M. Pitman Publishing Company, New York, 1938.

For this purpose the writer established contact with a large number of the American medical colleges.

The list of colleges used in this survey was taken directly from the American Medical Directory of 1936, which presents the list as being a statement of the approved medical colleges in the United States.

A form letter, addressed to the medical school, was sent to each of these colleges. The letter read as follows:

> Kindly send me a catalogue of the courses offered at your medical school. Any additional information or descriptive material regarding instruction in Speech Pathology and Correction would be greatly appreciated, as I am especially interested in this field.

In answer to the majority of these requests, bulletins from the medical schools were received. Some colleges, however, interpreting the inquiry as an application for admission, refused to consider the writer as a possible candidate. To these a second letter was sent, explaining that the information sought was of value in composing a statistical survey. This brought many further replies, but a few have as yet neglected to answer.

In other cases, where it seemed possible that certain courses in Otorhinolaryngology or Psychiatry might deal with matters of Speech Correction, a special note, requesting the explanation of these courses, was written. Here again the colleges were very obliging.

In a few instances, where the replies to the first series of inquiries were very recently received, the replies to the second series have not as yet come. However, in the light of the results already obtained, it is doubtful that any further positive information will result from them. Such additions as seem important will be presented in a supplementary list, if and when they arrive.

There follows a statistical representation of the results of this survey.

Key

The first column, marked "No.," shows the order in which the colleges were listed in the Directory and makes reference to the colleges easy.

The name and location of the institution, also copied from the Directory, comprise the second and third columns.

The next three columns represent the replies received to the first, second, and third series of inquiries, respectively. In these columns, the symbols are explained as follows:

B refers to a Bulletin.
R refers to a Refusal of Admission.
L refers to a Letter of Explanation or Description.
A refers to an Application for Admission.
O refers to No Reply.
P refers to a Pending Reply.

The seventh column shows the number of years of study required for the completion of the medical school course.

The last column lists very briefly any positive findings, which are elaborated in the conclusion.

STATISTICAL SUMMARY

No.	Name of Institution	Location	R_1	R_2	R_3	L	Results
1.	U. of Alabama	University, Ala.	B			2	
2.	U. of Arkansas	Little Rock, Ark.	R	P			
3.	Coll. Med. Evangelists	Loma Linda, Cal.	L	P		4	
4.	Stanford U	San Fran'co, Cal.	B			4	
5.	U. of California	Berkeley, Cal.	BL			4	Clinic, Out-Patient
6.	U. of So. California	Los Angeles, Cal.	B	P		4	
7.	U. of Colorado	Denver, Col.	R	B		4	
8.	Yale University	New Haven, Conn.	B			4	
9.	George Washington U.	Washington, D.C.	B			4	
10.	Georgetown U	Washington, D.C.	B	L		4	Clinic, Hospital
11.	Howard U	Washington, D.C.	L				
12.	Emory U	Atlanta, Ga.	R	L			
13.	U. of Georgia	Augusta, Ga.	R	R			
14.	Loyola U	Chicago Ill.	BL			4	
15.	Northwestern U	Chicago, Ill.	L	P—L			Occasional Lecture
16.	Rush Med. College	Chicago, Ill.	B	P		4	Special Course
17.	U. of Illinois	Chicago, Ill.	R	B		4	
18.	Indiana U	Bloomington, Ind.	B	L		4	
19.	State U. of Iowa	Iowa City, Iowa	R	P			
20.	U. of Kansas	Kansas City, Kan.	Refused to send literature				
21.	U. of Louisville	Louisville, Ky.	LAB			4	
22.	Louisiana State U.	New Orleans, La.	R	R			
23.	Tulane U. of La.	New Orleans, La.	R	L			
24.	Johns Hopkins U.	Baltimore, Md.	B	P		4	
25.	U. of Maryland	Baltimore, Md.	B			4	
26.	Boston U	Boston, Mass.	B			4	
27.	Harvard U	Boston, Mass.	B			4	
28.	Tufts College	Boston, Mass.	L				
29.	U. of Michigan	Ann Arbor, Mich.	L	B		4	Special Course
30.	Wayne U	Detroit, Mich.	B			4	
31.	U. of Minnesota	Minneapolis, Minn.	B	L		4	Clinic and Course
32.	U. of Mississippi	University, Miss.	R	B		2	
33.	St. Louis U	St. Louis, Mo.	B	P		4	Laryngology Dept.
34.	U. of Missouri	Columbia, Mo.	B			2	
35.	Washington U	St. Louis, Mo.	B			4	
36.	Creighton U	Omaha, Neb.	B			4	
37.	U. of Nebraska	Omaha, Neb.	L				
38.	Dartmouth College	Hanover, N. H.	B			2	
39.	Albany Med. College	Albany, N. Y.	AB			4	
40.	Columbia University	New York, N. Y.	LB			4	
41.	Cornell U	Ithaca, N. Y.	AB			4	
42.	Long Island U	Brooklyn, N. Y.	B			4	
43.	Flower Hospital	New York, N. Y.	L				
44.	New York U	New York, N. Y.	B	L		4	
45.	Syracuse U	Syracuse, N. Y.	L				Clinic, Out-Patient
46.	U. of Buffalo	Buffalo, N. Y.	AB			4	

STATISTICAL SUMMARY—(Continued)

No.	Name of Institution	Location	R_1	R_2	R_3	L	Results
47.	U. of Rochester	Rochester, N. Y.	B			4	
48.	Duke University	Durham, N. C.	O	P—B		4	
49.	U. of No. Carolina	Chapel Hill, N. C.	R	LB		2	
50.	Wake Forest College	Wake Forest, N. C.	O	P			
51.	U. of No. Dakota	Grand Forks, N. D.	L			2	
52.	Ohio State U	Columbus, Ohio	A	B		4	
53.	U. of Cincinnati	Cincinnati, Ohio	B			4	
54.	Western Reserve U.	Cleveland, Ohio	LB			4	
55.	U. of Oklahoma	Oklahoma City, Okla.	B	P		4	
56.	U. of Oregon	Portland, Ore.	B			4	
57.	Hahnemann Med. Col.	Philadelphia, Pa.	B			4	
58.	Jefferson Med. College	Philadelphia, Pa.	O	P			
59.	Temple University	Philadelphia, Pa.	B	P—L		4	Clinic pending
60.	U. of Pittsburgh	Pittsburgh, Pa.	B	L		4	Clinic and Lecture
61.	Woman's Med. Coll. Pa.	Philadelphia, Pa.	LB			4	
62.	So. Carolina State Med. College	Charleston, S. C.	B			4	
63.	U. of So. Dakota	Vermilion, S. D.	B			2	
64.	Meharry Med. College	Nashville, Tenn.	L	LB		4	
65.	U. of Tennessee	Memphis, Tenn.	O	P			
66.	Vanderbilt U	Nashville, Tenn.	B	L		4	
67.	Baylor U	Dallas, Texas	B			4	
68.	U. of Texas	Galveston, Texas.	R	B		4	
69.	U. of Utah	Salt Lake City, Utah	AB			2	
70.	U. of Vermont	Burlington, Vt.	R	B	L	4	
71.	Med. College Virginia.	Richmond, Va.	B			4	
72.	U. of Virginia	Charlottesville, Va.	B			4	
73.	West Virginia U	Morgantown, W. Va.	LB			2	
74.	Marquette U	Milwaukee, Wis.	B			4	Clinic
75.	U. of Wisconsin	Madison, Wis.	R	B	L	4	Clinic and Courses

Conclusions

Although all the medical colleges in the United States are not included in this survey, by far the large majority of them are accounted for. Seventy-five colleges comprise the list approved by the American Medical Association, and each of these accredited institutions was contacted. Of this total, only three have failed to supply any definite information. Of these, the U. of Kansas (No. 20) is conspicuous, having absolutely refused to send any information to persons residing outside the state. The U. of Georgia (No. 13) and Louisiana State U. (No. 22) seem to be merely avoiding the issue, each of them having replied to two specific inquiries, by rejecting my "application for admission."

Of the remaining seventy-two colleges, just twelve may be counted as positive findings. Seven of these have speech clinic facilities; one has a speech clinic pending; one has an occasional lecture; two offer special courses; and the last is included because of its excellent and promising work in laryngology. The clinics for

speech defectives are usually run as part of the hospital of the Medical College, and generally in its Out-Patient Department. They are conducted by students of the associated medical college under the supervision of professors of Speech or Psychiatry. Courses in Speech Correction, in which we are particularly interested, are offered by only five of the colleges questioned.

The number of positive replies is revealingly small. Upon closer inspection, the components of the group of affirmative answers are found to be quite restricted in scope.

Discussing them in numerical order, we come first to No. 5, the U. of California, whose answer read as follows:

> We do not offer a course in the correction of speech defects. However, in connection with our Out-Patient Department we have classes for those suffering from speech defects. These are held on Saturday mornings under the direction of teachers from the San Francisco School Department. This is a free clinic and is open to all ages. At present the youngest patient is three years old and there are many adults. The following types of speech defects are handled:
>
> Stuttering
> Stammering
> Nervous hesitation
> Articulation defects
> Lisping
> Lateral S
> Baby-talk
> Delayed speech
> Cleft-palate speech

Although the college itself offers no particular training for speech correctionists, it performs an outstanding service to society in maintaining this excellent clinic.

A similar situation exists at Georgetown U. (No. 10). Dr. D. P. Hickling, Professor of Psychiatry there, informs us that they "have a very excellent clinic for speech defects and their correction at the Georgetown U. Hospital."

Dr. C. T. Simon, Professor of Speech Re-Education at Northwestern U. (No. 15), says that "the Medical School does have an occasional lecture in remedial techniques, but no other work as far as I know."

Rush Medical College (No. 16) is one of the very few that offers any specific courses in the field. As one of the special courses offered as graduate instruction in the Department of Otolaryngology, a course called Speech Defects is listed. The writer communicated with Dr. E. L. Kenyon, who teaches the course, asking for a fuller description of the subject matter of the course. The reply is pending.

Another of these unexpected speech courses appears in the curriculum of the Anatomy Department of the U. of Michigan (No. 29). The course is listed as follows:

> 202. Anatomy and Function of the Vocal Apparatus.
> Assistant Professor Strong.
> Second semester only, 1938.
>
> Open to medical and graduate students; required of all graduate students majoring in bio-linguistics. Following an introductory survey of the phylogenetic and developmental history of the vocal organs of man, the course proceeds to an

intensive study of their gross and microscopical anatomy. The nervous mechanisms associated with speech and the influence of the endocrine glands on the larynx receive special consideration. In the laboratory the students dissect the neck and oropharyngeal region in minute detail, the thorax fairly comprehensively, and the abdomen and pelvis only in so far as these latter regions contain structures involved in the production of speech.

The U. of Michigan has evidently become aware of the need, and merits high commendation for the introduction of a major in bio-linguistics into its curriculum.

At the U. of Minnesota (No. 31), it is the Department of Pediatrics which considers speech problems. Here a course called "Clinical Diagnosis in Infancy and Childhood" is offered. It consists of "the pathogenesis of disorders of childhood and their recognition and classification including the disturbances of speech, psychiatric disorders, dental diagnosis and indications for orthodontia."

Prof. Irvine McQuarrie, head of the Pediatrics Department, also states that the college maintains a "Speech Clinic which runs in connection with the Departments of Pediatrics and Otolaryngology. This is conducted under the direction of Dr. Bryng Bryngelson, Ph.D., who is assisted by Caroline Adams, M.D. Attention has been given primarily to patients suffering from stuttering, from abnormalities of the palate and other organs involved in speech."

Although it does not offer any courses dealing specifically with speech problems, St. Louis U. (No. 33) affords such a complete training in Psychiatry and Otolaryngology that the writer feels certain that some attention is given to speech work in the courses offered by these departments. We are awaiting an answer to a second inquiry which will probably justify our including this college among the positive results.

Syracuse U. (No. 45) says, "We offer no courses in Speech Pathology and Correction, although we have a clinic in our Out-Patient Departments which is in the charge of Professor Harry Heltman, of the School of Speech of the University."

The letter from Dr. R. F. Ridpath, of Temple U. (No. 59) is sufficiently significant to be quoted in its entirety.

"In connection with your inquiry in regard to Speech Pathology and speech classes at the Temple University Medical School, we did have a clinic in which this was taken care of for a number of years, but there seemed to be so little interest and such a small number attending the clinic that it has been discontinued for the time; however, in the Temple University itself they have classes in Speech Correction particularly associated with stammering and stuttering. Some of these days we contemplate starting another clinic at the hospital but cannot give you any definite date at the present time."

Dr. H. M. Little, of the U. of Pittsburgh (No. 60) said, that as far as he knew, there were no specific courses in speech considerations at the college. However, "in my last lectures to the senior class on Child Psychiatry, speech disturbances are considered briefly in connection with a discussion of the oral stage of psycho-sexual

development." He also informs us that a fine speech clinic is conducted by Dr. E. L. Piper at the Children's Hospital, one of the University Hospital Group.

Finally, we have a letter from Professor Robert West, of the U. of Wisconsin (No. 75). He says that Speech Pathology "is not treated as such in the formal courses of the College. Doubtless, however, a good many references to it occur in neurology, orthopoedics, pediatrics, psychiatry, otolaryngology, etc. The College of Medicine participates very definitely in the work of Speech Pathology in a clinical program, co-operating with the speech clinic of the Department of Speech. There is the most cordial professional alliance between the various departments of the University Medical Clinic and the Speech Clinic."

Doctor West brings out a very interesting point. While there may not be any reference in the medical curricula to Speech Pathology as such, it still may be considered under related or associated divisions. It is, therefore, possible that many more schools than the writer has indicated do give some partial attention to the problem, but this attention is not evident from any of the catalogues or letters received.

It is now quite clear that the American medical college affords a very inadequate technical background for potential speech consultants. However, the highly specialized training they require will probably be available in a few short years, as speech consciousness in the nation is spreading to all educational institutions in an ever-widening arc.

Society owes it to itself to provide an army of capable speech-doctors for the nation.

BOOK REVIEW

ORAL AND FACIAL RESTORATIONS IN CONNECTION WITH SPEECH DEFECTS. By H. ROUND. London: *Speech*, Journal of the British Society of Speech Therapists, 2:19-38 (October) 1936.

A plastic surgeon describes and illustrates cases from his field whose troubles resulted in speech defects, and their restorations made way for the removal of the speech disorder. "Types of restoration most commonly called for in hospital practice are the loss of the nose only, part of the cheek or upper lip only, or loss of parts or of the whole of the nose together with parts or the whole of the cheek or upper lip as a result of such conditions as lupus, syphilis, rodent ulcer, and acute malignant conditions, and loss of parts of the upper jaw as a result of syphilis or malignant conditions. . . . I have realized that where restoration has been required to supply the loss of the soft palate and the nose, the most perfect obturator will not restore speech to perfection until the nose is in place."

—C. H. V.

THE THEORETICAL IMPORTANCE OF CERTAIN FACTORS INFLUENCING THE INCIDENCE OF STUTTERING*

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This paper is an attempt to bring together the essential findings of four previous studies concerned with various phonetic, grammatical, psychological, and semantic factors which apparently influence the locus of stuttering spasms in the speech sequence, and to show the importance of these factors in any theoretical consideration of the problem of stuttering.

Since three of the four studies referred to were based upon the same data, it is important to make clear what sort of data were used. Thirty-two stutterers served as subjects in the collection of the data. Each of these read approximately ten thousand words of material to the experimenter. The material was composed of five 1000-word reading selections, each of which was read twice by each case. The material was simple in construction and thought, and was entirely factual in nature. The experimenter recorded on a mimeographed copy of the selection being read all stuttering spasms, reading errors, mispronunciations, and variant pronunciations. In a few cases the amount and severity of stuttering were so great that the subject was unable to complete the reading. Such instances were few, however, and their occurrence did not prevent the collection of adequate data for any subject.

The reliability of the experimenter was determined by correlating his marking of spasms from a phonograph record of stuttering speech with the count known to be correct, and was found to be .99. A more complete discussion of this method of determining reliability will be found in Johnson and Brown (1).

Analyses were made of the data to determine the influence of various possible factors which might conceivably influence the locus of stuttering spasms in the speech sequence. The first of these analyses was a study of stuttering in relation to various speech sounds (1). In this study only those spasms occurring on sounds in the initial position of words—92.19% of all spasms recorded—were considered. A rank order of difficulty of sounds for stutterers was found, basing the rank on the median per cent. of the number of occurrences of the sound which were stuttered in the sample of thirty-two cases. This rank order may be termed the phonetic

*This paper is based upon studies made at the Speech Clinic at the University of Iowa, Professor Lee Edward Travis, Director.

factor of difficulty for stutterers. The rank order of difficulty for any given subject might differ considerably from that for the group as a whole, indicating that individual factors were operating in each subject to influence the difficulties each case experienced in relation to various sounds. For the group as a whole, however, and in the great majority of individual cases it was found that consonants were more difficult than vowels, there being almost no overlapping in the case of the group rank order of difficulty.

An early check on the possibility of the operation of other than phonetic factors was made by the use of another type of reading test, which contained simple words arranged in haphazard order without any connected meaning. In such a test the influence of such possible factors as the grammatical function of the words and their position in the sentence would be very nearly, if not completely, eliminated. It was found (2) at once that only fourteen of the thirty-two cases stuttered as much as one per cent. of these words. In these fourteen cases it was found that as in the other type of test there were differences in the percentages of stuttering in relation to different sounds, and that many of these differences were statistically significant. In every one of the fourteen cases, however, the rank order of difficulty of sounds differed considerably from the rank order of the sounds when they appeared in words in the contextual material on which the previous study (1) was based. This fact seemed to indicate that other than phonetic factors were operating to influence the locus of spasms.

Accordingly an analysis was made of the reading selections of factual material to determine in relation to which parts of speech stuttering spasms had occurred.[1] As in the phonetic analysis, it was found possible to arrange the parts of speech in a rank order of difficulty (3). As contrasted with the many individual differences in relation to the sounds which occasion greatest difficulty, it was found that the grammatical factor was much more consistent, both as regards the amount of agreement between the individuals and the group and as regards the same individual's performance from one time to another. Although the phonetic and the grammatical factors were found to be interrelated, it was shown statistically that a grammatical rank of difficulty exists independently of phonetic differences. Generally, it was found, those parts of speech which are crucial to sentence meaning were stuttered a greater percentage of the time than those parts which are relatively unimportant to the meaning.

The fourth study (4) considered stuttering in its relation to word position and accented or unaccented syllables of words. It was found that stuttering is more likely to occur on accented than on unaccented syllables, and that the first three words of sentences and paragraphs are more likely to receive stuttering than other

[1]The writer wishes to acknowledge the kind assistance of Professor George William Small, of the University of Maine, in the grammatical analysis of the reading material.

words, with the first word being the most difficult and the third word the least difficult of the three.

When one considers the findings reported in these four studies with the idea of attempting to account for them in terms of more fundamental and basic factors, two types of explanation suggest themselves. The first of these would account for the various differences found by means of physiological conditions—states of tension and activity of the speech mechanism. Fairbanks (5) correlated the rank of difficulty of sounds for stutterers (1) with other measures of sounds in the literature, finding negative correlations between sound difficulty for stutterers and both intensity (6) and duration (7) of the sounds. He points out that the sounds which are more difficult for stutterers require in general more rapid and precise articulation and phonation and necessitate the most extreme and active use of the speech mechanism. He also shows a significant positive correlation between the difficulty of sounds for stutterers and their difficulty for two-year-old children, with the latter data being taken from Wellman, Case, Mengert, and Bradbury (8). Since there is adequate reason to believe that difficulty for two-year-old children is a justifiable measure of the normal physiological difficulty of sounds, this correlation supports those concerning intensity and duration, and indicates that those sounds which are normally of greatest physiological difficulty tend to receive greater amounts of stuttering.

A possible physiological explanation also appears when the grammatical and accent factors are considered. Steer and Tiffin (9) determined the relative intensity given the various parts of speech by a sample of six speakers. The grammatical rank of difficulty was found to have a correlation (rank-order) of .92 with the ranking of the parts of speech in intensity by Steer and Tiffin's speakers. This fact would at first appear to be in contradiction with Fairbanks' (5) negative correlation between sound difficulty and intensity. The contradiction disappears when one considers that Fairbanks' correlation was based on the stuttering on initial sounds of words (1), whereas the Steer-Tiffin ranking is based on the peak phonetic power of the words, which depends on the intensity of the loudest vowel sound. Only occasionally is this latter identical with the initial sound.

This greater stress which Steer and Tiffin found to occur on certain parts of speech requires of the speech mechanism greater tension and increased activity. The high correlation between the Steer-Tiffin data and the grammatical rank of difficulty for stutterers is further evidence for a physiological component in the various factors of difficulty.

A similar explanation may be offered for the relationship between syllable accent and the occurrence of stuttering. A number of studies of accent, among which may be mentioned those of Schramm (10), Ortleb (11), and Steer and Tiffin (12), agree upon higher pitch, increased intensity, and longer duration as fundamental char-

acteristics of accented syllables. These characteristics require of the speech mechanism greater activity and increased tension for their production. Here again is a possible physiological basis for the differences found.

One reasonable physiological explanation of stutterers' difficulty on the opening words of sentences is the change from a condition of inactivity and repose to one of activity. The lesser proportion of the succeeding words that causes difficulty may be accounted for in terms of the adjustment of the mechanism to the demands placed upon it.

From the analysis in the preceding paragraphs a possible physiological explanation of the relation between the occurrence of stuttering and speech sounds, parts of speech, syllable accent, and word position emerges. Those points in the speech sequence at which greater tension, increased activity, and more rapid and precise articulation and phonation are required are the points at which stuttering is most likely to occur. This does not mean that spasms do not occur at other points, for relatively simple speech sounds, unstressed parts of speech, unaccented syllables, and words in unstressed positions are frequently associated with stuttering. But from evidence presented by four widely differing analyses of the oral reading performances of the subjects studied it appears that there are certain points in the speech sequence which are definitely more likely to be associated with stuttering than any others, and it is possible to associate with these points one or more of the physiological conditions of the speech mechanism enumerated above.

The second fundamental factor which suggests itself as a possible explanation of the findings under consideration is a psychological one. It will be remembered that grammatical analysis of the data showed that words upon which sentence meaning depended most tended to receive greater amounts of stuttering, whereas a lower proportion of words less important for meaning was stuttered. To put it another way, a greater proportion of those words which were prominent because of their contribution to sentence meaning was stuttered.

The study of stuttering with relation to word accent shows that those syllables which are more prominent than the rest because they are accented are stuttered more (in proportion to the frequency of their occurrence) than the rest. The study of word position and stuttering indicates the relative difficulty of those words which are prominent because they come at the beginning of sentences or paragraphs.

The greater difficulty of consonants over vowels holds the clue to one of the possible psychological components of the phonetic factor of difficulty. It is the consonants which give clarity and distinctness to speech as opposed to the vowels, which give it volume. And it will be remembered that for almost all of the cases consonants were markedly more difficult than vowels. It is all consonants together

rather than any single consonant or small group of consonants which give clarity and distinctness, and although a considerable disagreement among the subjects is found as to the exact rank of difficulty of the sounds, almost every case ranks consonants above vowels. One might draw the inference that the greater difficulty of consonants as compared with vowels is in part due to their greater relative importance for clarity and distinctness, and hence meaning, whereas the exact rank of difficulty of both consonants and vowels may largely be determined by random psychological factors, such as associations or fears formed with reference to specific sounds, in each individual case.

A further point of psychological importance is that 92.19% of all spasms studied in these investigations occurred in relation to the initial sounds of words. That it is perfectly possible for spasms to occur at other points is demonstrated by the fact that the other 7.81% of the spasms were distributed over all other points in the words—medial vowels, final consonants, medial consonants, etc. Yet less than one spasm in twelve came in relation to any other sound than the initial sound in the word. Furthermore, of the 7.81% of the spasms occurring elsewhere, almost all occurred in relation to the beginning sound of a second, third, or fourth syllable. Less than one-half of one per cent. of all spasms studied did not occur on the initial sound of a syllable, either at the beginning of a word or within it. This suggests that stuttering is more likely to occur on sounds which are prominent by virtue of standing in the initial position of a syllable, and is much more likely to occur if the sound is prominent because it occurs in the initial position of a word.

The psychological element common to all these classifications of sounds, parts of speech, syllables, and word positions in relation to which stuttering is more likely to occur is their prominence and conspicuousness for one reason or another. The influence of this element on the frequency of stuttering has been discussed in several of the previous articles (3), (4). The fact that the stutterer is usually unwilling to stutter is well known (13), (14), (15), (16). It is entirely reasonable to assume that this unwillingness to stutter would be greater at those points in the speech sequence which for one reason or another are more prominent than others. It is at those points that the speech of the stutterer (or of the normal speaker, for that matter) is under closer observation, and it is natural that he should place a greater premium upon fluency at those points.

Steer and Johnson (17) have shown that frequency of stuttering varies directly as the degree of unwillingness to stutter. Van Riper (16) has shown that many of the reactions of the adult stutterer which have been termed secondary symptoms (18) begin to occur early in the stutterer's history as voluntary attempts to avoid expected stuttering. Such devices become habits and form a part of the stutterer's abnormality. Because they represent attempts on the part of the stutterer to avoid spasms and speak normally, it is reasonable to infer that they would occur with greater frequency

at those points at which the stutterer's speech is more conspicuous and at which he feels a greater desire not to stutter. These two studies (17), (16), indicate something of the general nature of the mechanism by which the prominence of certain points in the stutterer's speech and his consequent greater desire to avoid stuttering result in a greater frequency of spasms at those points.

Additional evidence that the stutterer has more difficulty when he feels his speech is conspicuous is found in the facts that most stutterers are almost if not entirely free from difficulty when speaking alone[2] and that less than half of the cases from whom the data herein referred to were collected stuttered as much as one per cent. when reading a test wherein all words were made equivalent with respect to function and position and carried no connected meaning (2).

It would be a serious misconstruction of the present discussion to interpret it as suggesting that the physiological and psychological forces which have been mentioned as likely influences operating to influence the locus of spasms are separate and distinct in their nature and manner of operation. The physiological influences refer to conditions of tension and activity in the speech mechanism, and the psychological influences refer to the subjective correlates of conditions of activity in the central nervous system, particularly in the cerebral cortex. The exact nature of these influences and the manner in which they affect the organism are obscure, but it is not the intent of the present discussion to suggest a sharp distinction between the two. It is only from ignorance as to muscular and nervous functioning that we are forced to refer to physiological as opposed to psychological factors.

It should also be pointed out that either there must be additional and more subtle factors operating to make stuttering likely than have been yet disclosed, or factors operating in the opposite direction to make stuttering unlikely. This is indicated by the fact that no stutterer had difficulty on every adjective or noun, on every accented syllable, on every word at the beginning of a sentence, or on every difficult sound. In fact every subject had difficulty at fewer than fifty per cent. of the points at which the phonetic, grammatical, syllable accent, and positional influences were in evidence, and every subject had difficulty at points at which none of these influences were operating. If certain grammatical and semantic functions and certain word positions make stuttering more likely, why does not every stutterer have difficulty on every word performing such functions or in such positions? The need for further research to answer this question is clearly indicated. The attempt to answer it in terms of relative stability or lack of stability of the organism requires that one explain the basis of the greater or lesser stability.

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[2]A quantitative statement of this fact may be found in the Steer-Johnson article (17) previously referred to.

It should be emphasized that the findings here discussed and the possible physiological and psychological bases for them throw little if any light on the original forces operating to cause stuttering or upon the nature of the condition in the individual such forces may create. However, by indicating the nature of some of the factors which may operate to influence the locus of stuttering spasms in the speech of the stutterer and some possible physiological and psychological bases therefor, they show more clearly and quantitatively than has heretofore been done the nature of some of the forces affecting the stutterer's speech. This in turn gives a clue as to what sort of condition must exist in order for such forces to produce stuttering spasms. The nervous system of the stutterer must be highly sensitive to fleeting and subtle changes of attitude in order for these to be registered overtly in stuttering spasms. It would appear that stuttering is the result of the complex interaction of physiological and psychological conditions in any given organism. The nervous system of normal speakers may be just as sensitive, and might react to cause stuttering spasms in the same way if the normal speaker were subjected to the same forces as the stutterer. This is obviously a difficult problem to study objectively, but it does not appear entirely inaccessible with present techniques, and research for the purpose of studying the problem is under way.

Additional evidence as to what sort of influences affect the stutterer will be revealed when a number of investigations now in progress are completed. For example, it is important to discover whether the length of the word *per se* influences its likelihood of being stuttered. Milisen (19) reports some data on this point tending to show that longer words are more likely to be stuttered, but the situation in which his data were gathered was quite different from the reading situation in which the present data were collected. Whether reading errors made by the subjects bear any significant relation to sounds or parts of speech is another important problem. Other word positions beside the first three words of sentences are being investigated as to their relationship with stuttering. Fairbanks (5) found no significant relationship between the difficulty of sounds for stutterers and the frequency of their occurrence, taking data on the latter point from Dewey (20). A similar investigation is in progress regarding the possible relationship between the frequency of occurrence of words and the relative amounts of stuttering on them.

Another type of research which might prove profitable is the study of different types of reading material and different situations and their effects upon the factors already demonstrated. An exhaustive study along these lines might not be repaid, but certainly the need for preliminary investigation is clear.

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THE OTOLOGIST AND THE SPEECH PATHOLOGIST

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It is a fundamental fact that all speech produced by a person with defective hearing must necessarily be imperfect, for the general observation is well recognized that speech is but an imitation of the sounds we hear, and if the model of such speech sounds is imperfectly heard there must be a defect in the production of such speech.

The most effective demonstration of this fact is incorporated in the phonograph disc produced some years ago by the acoustic engineers of the Bell Telephone Laboratories (demonstration of phonograph record).

The record will first reproduce normal speech heard by the normal hearing at a distance of 40 feet. The next sentence of the phonograph record reproduces this same speech with a depreciation in intensity, as heard by a subject with 20 dcb. or dynes depreciation from normal hearing. The third phrase gives an audible demonstration of the same record heard by a subject with 40 dcb. defect in hearing.

To you, with normal hearing, therefore, this record is a practical index of the sound impressions gained by subjects with varying degrees in hearing acuity and is one of the few practical devices suggested by which we familiarize ourselves with imperfections in speech as they are carried to the ear of one with defective hearing of various degrees.

From this we may readily deduce that the deaf child who has either no or only a modicum of hearing is almost completely handicapped in the use of his hearing as a guide to his speech. To a lesser degree this also applies to the hard-of-hearing child or to the deafened adult. Even where sound amplification has offered a means of overcoming this handicap to a large degree the model of speech heard by a defective ear can never be as perfectly interpreted and reproduced as by one with normal hearing.

How far we have succeeded in overcoming such handicaps is the concern of the otologist, the acoustic engineer and the special teacher.

Instruction in speech of the totally deaf child with no physiological function of hearing to guide him, must, of necessity, depend on other forms of contact and the use of available sensory equipment.

We have, then, vision and the sense of touch as our means of approach. By vision the deaf child is taught the position and action of all articulatory muscles and organs. By tactile impression he first realizes the sounds that emanate from the mouth, nose and resonating

cavities. It is an arduous task requiring a world of patience and understanding—understanding not only of the psychologic urge to speak and the scholastic ambitions of the child but also a thorough knowledge of his speech mechanism, hearing organs and the value and application of tactile impression.

Added to this are the accessories which the rapid progress in radio and telephone engineering have made, the introduction of audiometers to measure the slightest remnants of hearing, the value of the oscillograph and its principle of converting sound waves into light graphs, the strobilion with its visual index of defects in speech as produced by the human voice and the phonelloscope to visually determine variation in tone intensity.

With a well qualified teacher, therefore, and these various accessories at her command, the totally deaf child may be taught not only fluent speech but also flexibility, pitch, accent, rhythm and volume control.

The other agency by which the totally deaf child makes his contact with you is through the art of lip-reading.

Armed with these two indispensable and practical assets, the emancipation of the deaf child today is no longer a theory but a practical entity, and we point with satisfaction to the well trained, totally deaf pupil of from four to seven years of age who, by the time he has completed eighth grade scholastic work, is ready to enter high school, later college or university with his normal hearing fellows and carry on efficiently and without embarrassment his further education and take his place as an independent and useful citizen in the speaking world.

The problem confronting a child who has once heard the human voice and who has had his hearing destroyed by meningitis, flu, exanthematas, etc., is not quite so complicated. To have once heard the human voice, even though this faculty is now denied him, is a tremendous advantage in his speech training and an easier task for his teachers.

The third largest class comprises the hard-of-hearing child where the defect in hearing is of varying degrees. The accomplishments of acoustic engineers, the production of the 4-A audiometer, the introduction of group hearing tests in public and private schools throughout the nation, the elimination of pupils whose hearing acuity is normal and the further testing and examination by otologists to determine the cause of these defects proceeds educationally and scientifically along somewhat different lines.

These children should be segregated in special classes in which all of their speech development is transmitted through their own sense of hearing with such sound amplification as is necessary in each given case. They should be carefully instructed in lip-reading and become masters of this art, for at a distance of ten, twenty or thirty feet from the source of sound, all amplifying devices must be regarded as insufficient substitutes, and the pupil must depend almost entirely on his lip-reading for such contacts.

Finally, there is the ever-increasing class of adult hard-of-hearing, affected by otosclerosis which must be considered in this summary.

Otosclerosis has been accepted as an hereditary factor in medical science; is distinctly on the increase and, therefore, should be an uppermost problem in the mind of every otologist.

I have endeavored to present this problem of the relation of the otologist to the speech correctionist and to the teacher of the deaf, as simply and tersely as possible.

The otologist is beginning to realize that he must assume some responsibility in the analysis and development of these problems, and departments of otolaryngology in schools of medicine are now recognizing the practical necessity of training the young otologist to a more detailed comprehension of this vital question.

Differential diagnosis of types of deafness is exclusively the domain of the otologist; advice to the parents of deaf or defective hearing children is not only his province but his duty. Acquaintance with modern pedagogic methods, special training and its results with deaf children in schools throughout the country should be cultivated. Co-operation in all problems of the deaf and hard-of-hearing as has been partially demonstrated by Leagues for the Hard-of-Hearing in various centers is a worthy and helpful act.

And so, the otologist must realize that the deaf and hard-of-hearing for whom no therapeutic or surgical relief is available are still part of his professional obligation and his contact with the teacher of the deaf and the speech correctionist should be one of the active factors in his professional program.

NEWS ITEM

The Indiana State Teachers College is beginning the development of a Speech and Reading Clinic. D. W. Morris, formerly of the State University of Iowa, and the University of Maine, is the Director. It is planned to develop the facilities of the Clinic to serve the needs of the College, the Laboratory School, and the section of the State of Indiana in which Terre Haute is located.

BOOK REVIEWS

SPEECH RECORDINGS AT SAN DIEGO STATE COLLEGE. By P. L. PFAFF. Los Angeles: *Western Speech*, 1:11 (June) 1937.

"Normal speech, if the speech of the average individual may be thus termed, seems so utterly free from vocal and articulatory difficulties, that correctionists confine themselves to the more serious problems of stuttering, lisping, etc. It is only when speech is subjected to amplification of the public address system or when it is recorded that the customary questions arise: 'Does my voice actually sound like that? Do I always slur my words?' We are educating for a generation that is more speech conscious than it has been in many years. With the increasing need for excellent speech and voice, it seems obvious that no college or university can be without the necessary electrical equipment to record the voices of those people who are actually desirous of improving themselves."

MEMORIES AND IMPRESSIONS OF A STUDENT (OF SPEECH THERAPY). By S. P. PICK. London: *Speech*, The Journal of the British Society of Speech Therapists, 1:37-39 (April) 1936.

In 1932 a student of speech therapy at the West End Hospital for Nervous Diseases studied for two years general psychology, phonetics, elementary anatomy, biology and neurology. At the same time the student spent the first seven months observing and then began clinical practice helping the staff. Several types of cases are taken including word deafness, stammering, agenesis of the motor speech center, hemoplegia with aphasia. Students also have opportunity to observe the group method of treating stammering and of teaching the deaf to speak and lip-read. However, the training course today, covers a much more extensive range of subjects.

A COMPARISON OF CONVERSATIONAL AND AUDIENCE SPEECH. By C. H. TALLEY. Iowa City: *Archives of Speech*, 2:27-40 (July) 1937.

This is a study of the vowel in *top* (probably [a]) in regard to its quality as between conversing and the increased volume as if to speak to a large audience. From the first to the second condition, there was a marked tendency to increase both pitch and intensity, and there was a marked shift in relative intensity from the lower to the higher partials. The less the change in intensity, the less marked the shift of energy from lower to higher partials. Likewise no shift in intensity brought any systematic shift of energy in the partials. Loss of intensity resulted in greater loss to high partials than to low. In general, when the speaker changed from conversation to large audience speech, three changed in quality resulted: heightened pitch, increased intensity, and a shift of energy from low to high partials.

—C. H. V.

MOTION PICTURE STUDIES OF THE VOCAL FOLDS AND VOCAL ATTACK

PAUL MOORE
Northwestern University

The interest in this discussion focuses on the films which are to be shown, but there are a few explanations which should be made before they are presented.

About four years ago a research program was started at Northwestern University's School of Speech to find out as much as possible about the functioning of the larynx during the production of voice. One reason for such a program was the simple fact that the behavior of the larynx is not completely understood. But of greater motivation was the desire to discover the causes of certain voice difficulties which are thought to be functional and for which no satisfactory medical or re-educative treatment has yet been devised. Such knowledge would, if known, have considerable therapeutic value.

The need for this information does not have to be pointed out to this group, because you, no doubt, have the same types of serious voice problems under your care that we have; problems which will be treated more effectively as their causes become better known.

Since the beginning of the general research program referred to, four projects have been carried out. Two of these used motion pictures as a means of gathering and recording date, and it is from these that the films presented here have been taken.

The first to be shown is from a study of vocal attack, the second, from a study of vocal lip vibration. In the former the interest is primarily in the movements of the larynx leading to and including the initiation of tone; in the latter, the activity of the vocal lips themselves is the center of attention. The two together present a rather clear concept of what goes on throughout the complete process of attack and vocalization.

The question posed for the vocal attack study was, "What happens in the larynx during the production of the various types of attack?" Underlying that question, however, was the more basic query, "What causes the glottal stroke, or glottal shock, which is so common in many voices?"

As you watch this film you will see a number of significant differences between the attacks, and a partial answer to the question as to the cause of the glottal shock. However the film will probably be of considerable interest just for the movements exhibited.

Show film. Mention:

(1) Stop film in early frames and point out structures to orient. Indirect method. No anesthesia.
(2) Color film, normal speed.
(3) Explain what is happening as it goes along.
(4) Illustrate the sounds produced.
(5) Black and white, slow motion—120 frames a second.
(6) Explain signal light.

No doubt you would like to know how those pictures were made. The technique was comparatively simple.

Show slide. Point out:

(1) The camera mounted on the special "chin-high" table and blocked to make stationary.
(2) Special camera capable of making 120 frames a second.
(3) f 4.5 six-inch telephoto lens.
(4) Position of the subject: four feet in front of the lens.
(5) 1000 watt light source.
(6) First surfaced guttural mirrors *and viewing mirror.*
(7) The heater for the guttural mirrors.

The most exacting part of the procedure was getting the subject placed correctly. This was accomplished by focusing the image on an oiled paper screen which was put in the film gate before the camera was loaded. The operator watched the focusing screen, and when the subject reached his correct position the small viewing mirror was adjusted so that it reflected the image to the subject's eye. This enabled the subject to control the laryngeal image to precisely that he could leave the photographing position for rest, to warm the mirror, etc., and to return to the proper place with certainty and without delay.

The technique of photographing required the subject to place himself and the guttural mirror so the image would be reflected into the viewing mirror and consequently into the camera lens. When the position was satisfactory, the activity to be photographed was produced and the operator signaled to start the camera.

Conclusions from this film must be drawn with care because of the limited number of subjects. However, there are two statements which can be made with reasonable certainty because other observations confirm them: (1) that the laryngeal movements preparatory to vocalization are very complex; and (2) that the so-called stroke attack involves more constriction in the superior laryngeal musculature than the breathed or the simultaneous attacks.

The film just shown illustrated the fact that ordinary and even slow-motion motion pictures do not present the individual vibrations of the vocal folds. In order to photograph these movements, extraordinary equipment must be used. It is possible to employ an ultra-high-speed motion picture camera capable of making more than one thousand exposures a second, or to use a glow-lamp stroboscope in

conjunction with an ordinary motion picture camera. Both of these methods have been used in our research, but the film which is to be shown presently is stroboscopic.

A stroboscope is an instrument which is commonly used in the study of rapidly repeating motions, such as rotations or vibrations. It produces an illusion in which the motion appears to cease or to become slower, depending upon the relationship between the frequency of the stroboscope impulses and the object's rate of movement. This phenomenon is caused by regular and rapid interruptions of the view of the object occurring at such intervals that the moving part is seen only at the same or nearly the same position in its cycle. As a result, identical, or nearly identical, images fall on the retina in rapid succession, producing the illusion of no movement or of slow movement.

The interruptions necessary for stroboscopic observation may be produced in a number of ways, but the most satisfactory method at the present time is to cause the light source to glow and darken alternately. The recent development of electrical circuits and gas-filled glow-lamps has made this type of stroboscope available for laryngeal research.

So far as I know, until the production of these pictures, the glow-lamp stroboscope had been used only for observation. This was due to the relatively feeble illumination provided by most glow-lamps. It is significant, therefore, as shown by this next film, that glow-lamps and electrical circuits have now been developed which produce enough light for photography.

In order to photograph with a stroboscopic light source, the equipment is arranged about as for stroboscopic observation. The principal difference is the substitution of a normal speed camera for the observer's eye. A second slide shows the set-up used in making the stroboscopic film.

Show slide of M. I. T. set-up. Point out:

(1) The automobile headlamp reflector with the glow-lamp in its center and the hole for the lens.
(2) The lens and camera. Explain that this was the ultra-high-speed camera; that pictures made by it are not projectable but are good for frame by frame study.
(3) Contactor mechanism used in the stroboscopic pictures.
(4) Subject's position regulated by a viewing mirror as in the previous film.
(5) Head phones connected to an oscillator to help subject hold the pitch constant.

This set-up and the film taken with it resulted from the co-operation of the Massachusetts Institute of Technology and Northwestern University. Prof. Harold Edgerton, of M. I. T., and his associates who have developed ultra high speed photography and glow-lamp stroboscopy beyond that achieved by anyone else, kindly consented

to adapt some of their equipment to our needs and to aid in making the pictures.

A description of the technical aspects of the apparatus does not seem indicated here, but an idea of the refinement achieved may be gained through the fact that the period of lamp glow in any one flash has been reduced to less than one-millionth of a second. To photograph within that interval of time requires extremely brilliant illumination.

These comments, I believe, provide sufficient preface for the stroboscopic film. Further explanation will be made as it is shown.

Show film:

(1) Stop and show parts again.
(2) Ask to pay particular attention to the way the vocal lips vibrate, i. e., the wave-like movements.
    a. Point out the anterior opening and the posterior progression, then the closing sweep anteriorly.
(3) Point out the repeated sections at the end.

Conclusions from this section of the research must also be drawn carefully because of the limited amount of data. However, strobolaryngeal observations of several other subjects substantiate what this film has shown, which is: That the vocal lips perform a complex wave-like vibratory movement. The wave starts with an opening between the anterior sections of the lips and progresses posteriorly as the folds separate. The closing phase of the movement appears to travel anteriorly from the arytenoid region. In such vibration the glottis remains open longer anteriorly than posteriorly, and the free edges of the vocal lips appear to move simultaneously and in phase, that is, in mirrored relation to each other.

See Back Cover for Convention Headquarters and Railroad Rates

PROGRAM

The Thirteenth Annual Convention
of the
AMERICAN SPEECH CORRECTION ASSOCIATION

Hotel Cleveland, Cleveland, Ohio, December 27, 28, 29

TUESDAY, DECEMBER 27, 1938

MORNING

9:00. Business Meeting (Qualified Members only)

10:30. PRESIDENT'S ADDRESS..MAX A. GOLDSTEIN, M. D.
"Practical Aspects of Speech Correction"

11:00. "The Year 1938 in Speech Correction"
Publications, Investigations, Experiments,
SARA STINCHFIELD HAWK, Ph.D., Vice-President
1577 N. Gower St., Hollywood, Cal.

11:20. Open Forum.....CLARENCE T. SIMON, Ph.D.,
Director, Speech Clinic, Northwestern University,
Evanston, Ill.

12:00. Recess

AFTERNOON

2:00. "Some Semantic Aspects of Stuttering,"
WENDELL JOHNSON, Ph.D.
Ass't Director Psychology and Speech Clinic,
University of Iowa, Iowa City, Iowa

2:25. Discussion

2:40. "Personality Traits of College Stutterers,"
JAMES F. BENDER, C. P.,
Chairman, Dept. of Speech, Queens College, Flushing, N. Y.

3:05. Discussion

3:20. "Effect of Deafness on Speech and Voice,"
MARIE K. MASON, A.M.
Dept. of Speech, Ohio State University, Columbus, Ohio

3:45. Discussion

4:00. "Voice Problems of University Students,"
RUTH MANSER, Ph.D.
New York University, New York City

4:25. Discussion

4:40. Council Meeting

5:40. Business Meeting

6:30. Recess

WEDNESDAY, DECEMBER 28, 1938

MORNING

Joint Session of the National Association of Teachers of Speech and The American Speech Correction Association

PRESIDENT J. T. MARSHMAN, *Presiding*

9:30. MAX A. GOLDSTEIN, M.D., President A. S. C. A.
Introducing:

9:45. JAMES BARRETT BROWN, M.D., St. Louis, Mo.
Address: "Prognosis in Post Operative Cleft Palate Speech"

10:30. Panel: "The Interfunction of the Elementary School Teacher and the Speech Therapist in Defective Speech Problems of School Children"

12:00. Recess

AFTERNOON

2:00. "The Problem of Stuttering"....MACK D. STEER, Ph.D.
Director, Speech Clinic, Purdue University, Lafayette, Ind.

2:25. Discussion

2:40. "Oral Recitation Problems of Stutterers,"
THELMA KNUDSON, A.M.
Instructor in Speech and Speech Correction, Central High School, South Bend, Ind.

3:05. Discussion

3:20. Panel: "Methods for Treatment of Stuttering,"
WENDELL JOHNSON, Ph.D.; GEORGE A. KOPP, Ph.D.; PAUL G. MOORE, Ph.D.; MACK D. STEER, Ph.D.; CLARA B. STODDARD, S.B.

4:20. "Treatment of Stuttering," Summary and Conclusions:
GEORGE A. KOPP, Ph.D.
Director, Speech Clinic, Wayne University, Detroit, Mich.

4:45. Business Meeting

5:30. Recess

THURSDAY, DECEMBER 29

MORNING

Joint Program

9:15. "Treatment of Aphasia"..... SAMUEL D. ROBBINS
Professor of Psychology, Emerson College, Boston, Mass.

9:40. Discussion

10:00. "Methods of Treatment for Spastic Speech," HELEN FAGAN, M.A.
Central Institute for the Deaf, St. Louis, Mo.

10:25. Discussion

10:40. "The Problem of Cleft Palate Speech," HERBERT KOEPP-BAKER, Ph.D.
Director, Speech Clinic, Pennsylvania State College, State College, Pa.

11:05. Discussion

11:20. Relation between Voice Defects and Personality Traits," WILBUR MOORE, Ph.D.
Associate Professor of Speech, Kent State University, Kent, Ohio

11:45. Discussion

12:00. "Stuttering in Relation to Size and Personnel of Audience," HARRIET PORTER
Simpson College, Indianola, Iowa

12:20. Discussion

12:35. Recess

AFTERNOON

2:00. "Chinese Difficulties with American Speech," C. K. THOMAS, Ph.D.
Director, Speech Clinic, Cornell University, Ithaca, N. Y.

2:25. Discussion

2:40. "Ear Training Techniques in Treatment of Articulatory Disorders"..... C. VAN RIPER, Ph.D.
Director, Speech Clinic, Western State College, Kalamazoo, Mich.

3:05. Discussion

3:20. "Original Methods and Materials for Young Children," MADELAIN SEVERNANS
Beverly Hills Schools, Calif.

3:45. Discussion

4:00. "Studies of Growth in Speech of Pre-School Children," MILDRED TEMPLIN, A.B.
Supervising Clinician, Speech Clinic, Purdue University, Lafayette, Ind.

4:25. Discussion

4:40. Recess

NATIONAL ASSOCIATION TEACHERS OF SPEECH

SPEECH DISORDERS SECTION

(Open to Members of the A. S. C. A.)

General Topic:

ORGANIZATION AND ADMINISTRATION OF SPEECH CORRECTION PROGRAMS

FRIDAY, DECEMBER 30

MORNING

11:00. "The Traveling Clinic".....C. R. STROTHER, Ph.D.
Director, Speech Clinic, University of Washington, Seattle, Wash.

11:25. Discussion

11:40. "The Speech Survey".....D. W. MORRIS, Ph.D.
Director, Speech and Reading Clinic, Indiana State Teachers College, Terre Haute, Ind.

12:05. Discussion

12:20. Recess

AFTERNOON

2:00. "Introducing Speech Correction Classes into New Public School Systems".....ROBERT MILISEN, A.M.
Director, Speech and Hearing Clinic, Indiana University, Bloomington, Ind.

2:25. Discussion

2:40. "Moving Pictures of the Shady Trails National Speech Improvement Camp".....JOHN R. CLANCY
University of Michigan, Ann Arbor, Mich.

3:10. Discussion

3:30. Adjournment

See Back Cover for Convention Headquarters and Railroad Rates

SUNDRY SPEECH DISTURBANCES

C. S. BLUEMEL, M. D.
Denver, Colorado

This paper presents a number of speech disturbances not previously discussed in the symposium.

Pseudo-stammering. First we consider a disturbance of speech which may be described as hysterical pseudo-stammering. This occurs as an incidental symptom of major hysteria of the emotional and dramatic variety. Pseudo-stammering presents a mechanical repetition of letters or words, but there is never evidence of blocking or emotional stress of the type that one observes in genuine stammering. An hysterical young woman who manifested this type of disturbance pronounced the word *once* as *one-one-once.* The word *times* she pronounced *time-time-time-times.* She used the phrase *cou-cou-couple of day-day-day-days.* She also used the expression, *I'll say-say-say-say I do.* This speech disorder will be recognized immediately as a spurious stammering without bona fide inhibition or blocking in speech. Pseudo-stammering is usually a transient disorder in the clinical picture of hysteria.

Inhibited Speech. Inhibition affects the peripheral speech organs and interferes with the mechanical production of speech. The resultant disturbance is usually aphonia or dysphonia. Inhibition also affects the mental processes and interferes with the inward production of speech. The resultant disturbance is amnesia or mutism. Amnesia frequently occurs when one attempts in a moment of flurry to introduce two people to each other or when one proceeds in a moment of embarrassment to present a speaker to an audience. Because of transient amnesia or inhibition the names are forgotten. Sustained inhibition may ensue as a result of shock of considerable severity, and the inhibition then presents itself as mutism. Inhibition may extend beyond the function of speech and may cause functional paralysis of the extremities. The patient then lies as though in a trance. He is unable to respond by speech or movement, but he still hears everything that is said. Mutism may last a few moments or may persist for several months.

Various degrees of inhibition occur between the two extremes here described.

Senile Speech is largely of the amnesic type. At first the patient is prone to forget proper names and thus he is momentarily halted in conversation. Later he forgets the names of common objects, and his speech becomes broken and fragmentary. In asking for a glass of water he may forget the word *glass* or the word *water* and he finds himself frustrated. The idea, however, remains, and he may do a good deal of gesticulating while he continues the effort to express

himself. In advanced senility the patient tends to become increasingly mute, though the restless and agitated patient may maintain a chatter of meaningless jargon. In the following example of senile speech the patient is trying to tell where he worked: "I work for—what was that? Oh pshaw!—George—it is that—what you call it—a bank, I mean to say. They know me very well because I work for them. I work for that man—what is his name—oh pshaw." Senile speech is sometimes marked by moments of fluency and moments of complete amnesia.

The Speech of General Paresis is marked by slurring, stumbling, and mispronunciation. There is a tendency to elide syllables so that words are partially telescoped. Speech is sometimes tremulous; at times it is rhythmic and lacking in inflection. It is not infrequently accompanied by quivering of the lips. The paretic displays increased ataxia when attempting such test phrases as ***methodist episcopal, third riding artillery brigade, British constitution***, etc. At times he will forget the words in attempting to repeat them. When excited, he may become momentarily mute. He may then stand helplessly gesticulating, with his mouth open, and with his face expressing bewilderment and consternation. Not infrequently the paretic has "strokes" or "spells" in which he loses his power of speech for several hours or several days. Such attacks are sometimes seen in neurosyphilis and they are not necessarily restricted to paresis.

The Speech of Multiple Sclerosis, or creeping paralysis, is usually described as *scanning*. The term is descriptive of the advanced stages of the disease, but it is seldom applicable to the early stages. In the early course of the disease the speech may be slow. Later there is loss of inflection and the patient speaks in a monotone. It is sometimes observed that he speaks deliberately or with conscious effort. In time the speech may become wavering or rhythmic in character and eventually it may assume the sing-song or scanning characteristics that are pathognomonic with this organic neurological disturbance. Frequently there is deficient power of articulation with multiple sclerosis, and the patient may be unable to call the word *kitty* continuously. In some instances there is ataxia, and speech becomes almost incomprehensible.

The Speech of Bulbar Palsy is marked by weakness of articulation and by nasality resulting from paralysis of the soft palate. The disturbance of the lower cranial nerves leads to muscular weakness of the lips, face, tongue, palate, and pharynx, and thus the speech organs fail of their function. Muscular weakness in time obliterates articulation, and speech eventually becomes incomprehensible. Because of muscular weakness the patient may be unable to purse the lips; as a rule he cannot protrude the tongue. Because of weakness of the masseter muscles he may become tired after chewing a few mouthfuls of food.

Amyotrophic Lateral Sclerosis is marked in its later stages by bulbar symptoms and resultant speech disturbance. In rare instances, however, the speech disturbance initiates the disease and the patient

then complains, not of weakness of the arms and spasticity of the legs, but of symptoms affecting the speech. A lawyer, 43 years of age, said that his voice had gradually lost its strength during the preceding six months, and that he now had difficulty in making himself understood when speaking in public. When tired he also had difficulty in dictating. Speech had become slurring and he could not put a clear *s* on the end of a word to distinguish plural from singular. He had a feeling of stiffness or weakness around the mouth, and when lying in bed he would sometimes find that a fold of cheek was caught between his teeth. Examination showed that the voice was weak and husky. Articulation was slurred, especially with the sibilant sounds. Speech was lacking in inflection. Soon the patient developed the common neurological signs of amyotrophic lateral sclerosis, from which disease he succumbed after a period of five years.

The Speech of Chorea is largely one of motor disability. There is a good deal of involuntary and incoordinate movement of the speech organs and thus enunciation is disturbed by grimacing, by sudden protrusion of the tongue, by clucking and sucking movements, etc. Speech is clumsy, or thick, or mushy, and at times it is difficult of comprehension.

The Speech of Bromide Intoxication. A person who takes bromide for a few consecutive weeks is likely to show an accumulation of bromide in the blood. At the end of two or three weeks this may amount to as much as 300 mg. per 100 cc. of blood. The patient may then display confusion and ataxia, which conspicuously disturb the function of speech. Articulation is slurring and difficult of comprehension. The thinking processes are clouded. This clinical syndrome is not uncommon in people who have acquired the Bromo-Selzer habit. However, the symptoms may appear when bromide is taken in any form for several weeks consecutively. Barbiturates may produce a somewhat similar clinical picture.

There are other defects of speech. Mention may be made of the retarded or infantile speech of the mental defective, of the spastic speech of cerebral birth injury, and of flat or muffled speech of paralysis agitans, Time, however, does not permit a description of all sundry speech disturbances.

A word on the comprehension of speech: When speech disturbance is accompanied by confusion, it is important to test the understanding of speech and not to limit the observations to the patient's articulative disorders. When comprehension of speech is impaired, the disabilities may relate more to the thinking processes than the speech processes. This differential point may prove to be important.

BOOK REVIEWS

COMMON ELEMENTS IN SILENT AND ORAL READING. By D. E. SWANSON. (in Tiffin—Studies in the Psychology of Reading). Princeton: *Psychological Monographs*, 48:36-60, 1937.

Among poor readers the common factors to oral and silent reading were inaccurate perception, poor comprehension, and slow rate of reading. Thus the clinician can be justified in diagnosing dislexia on the basis of oral reading tests. Further oral reading inaccuracies should be smoothed out before working on comprehension and rate—the reverse would only enhance his difficulty.

SPEED AND ACCURACY OF CLOCKWISE AND COUNTER-CLOCKWISE MOVEMENTS. By C. VAN RIPER and B. BRYNGELSON. *Journal of Psychology*, 1:247-253, 1937.

Both right and left handed subjects were able to draw faster and more accurately with their right hands when going in a counter-clockwise direction of rotation. Both right and left handed subjects were able to draw faster and more accurately with their left hands when going in a clockwise direction of rotation. This throws some light on the spontaneous appearance of mirror script in left handed children. All but a few of our letters of the alphabet are formed with dominantly counter-clockwise movements.

DISINTEGRATION IN THE SPEECH MUSCULATURE OF STUTTERERS DURING THE PRODUCTION OF A NON-VOCAL TEMPORAL PATTERN. By Y. L. HUNSLEY. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49:32-49, 1937.

Stutterers were inferior to normal speakers in their ability to perform a silent pattern of movement in time with the speech musculature.

ACTION CURRENT PATTERNS OF HOMOLOGOUS MUSCLE GROUPS DURING REFLEX ACTIVITY. By M. PATTERSON. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49:205-233, 1937.

Action current records of simultaneous bilateral reflex responses were taken from the quadriceps femoris, gastrocnemius, and masseter muscles. Records were taken from both normal and neurological cases. No significant differences in latency and pattern were discovered in the normal subjects. There was marked similarity between reflex patterns of two homologous muscles. Evidence was obtained that the reflex on one side influences the same and concurrent reflex on the opposite side, lengthening the latency. There was an equality of latency between ipsolateral and crossed reflexes. Both latency and pattern of the reflex response of the affected side may be altered by unilateral neural lesion of the higher centers.

—C. H. V.

HEARING DEFICIENCIES IN RELATION TO SPEECH DEFECTS*

HORACE NEWHART, M. D.
Minneapolis, Minnesota

From a recent contribution by no less authority than your greatly honored president, Dr. Max A. Goldstein, I quote the following impressive figures: Among the 50,000,000 children of school age in the United States are 40,000 blind, 60,000 totally deaf, 80,000 partially sighted, 300,000 crippled, 3,000,000 hard of hearing, and 4,000,000 defective in speech.

Since articulate speech is normally acquired by imitation through hearing, vision and touch (hearing being by far the most essential), the last two quoted figures forcibly indicate the fact that subnormal hearing causes a very substantial proportion of speech defects. None can be more conscious of this fact than you, the members of this group. The public, including our legislators, have failed largely to grasp this thought.

Notable advances in electro-acoustics during recent years have resulted in outstanding progress in otology. The development of the audiometer has provided greatly improved, standardized means for accurately measuring hearing acuity, has made possible valuable research in ear physiology and pathology, and contributed to rapid improvement in the performance characteristics of electric hearing aids.

It is our purpose to present briefly from the otologist's point of view some of these newer facts as related to speech defects.

Extensive use of audiometers, particularly among school children, has disclosed an amazingly high incidence of hearing deficiency which has been overlooked by the methods previously available. In fact the new methods of testing the hearing have been shown to be from four to five times as accurate as our older methods. This revelation has emphasized the importance of periodically checking the hearing of all children, including those of pre-school age, to disclose a significant hearing loss. For our purpose we would define broadly a significant hearing loss as any deficiency of hearing acuity which constitutes an existing or potential interference with the normal acquisition of articulate speech, average educational advancement and reasonable achievement with respect to one's economic and social life. It should be noted that among school children a significant loss may be caused by a relatively slight hearing deficiency. The early discovery of such a loss is of great importance since it may be the only indication of a beginning handicapping deafness.

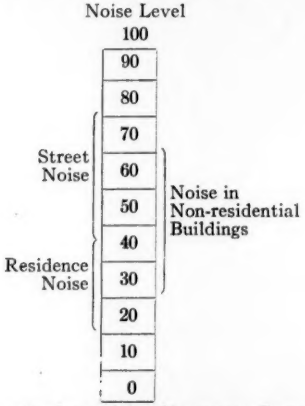
We have only recently learned the important principle that no hearing test can be accurate for the detection of a slight hearing

*Read at the Annual Meeting of the American Speech Correction Association, Chicago, October 12, 1937.

impairment when made in the presence of any distracting or interfering noises such as those which are ordinarily present in the average office or school building in a city. Besides distracting the attention of the person being tested, the noises mask the sounds used for testing. The noise levels encountered are well shown in Figure 1 from the report of the New York Noise Abatement Commission of 1930. For accuracy in making hearing tests the noises must be reduced to a practical working level by modern acoustic treatment both in medical offices and school buildings.

Our time-honored methods for testing the hearing by the watch-tick, acoumeter, the whisper and the conversational voice as ordi-

RANGES OF NOISE LEVELS FOUND IN NEW YORK CITY



Values for street noise from Noise Abatement Commission Survey: for other noises, from N. E. L. A.-A. T. & T. Co. survey. All values are averages for the locations tested.

FIG. 1. From City Noise. Report of Noise Abatement Commission, Department of Health, New York City.

narily applied have proved too crude, inaccurate and time-consuming for the requirements of modern otologic practice. The futility of depending upon the use of the loud whisper and the conversational voice for detecting slight hearing loss is well illustrated by Table I from Dr. Harvey Fletcher's "Speech and Hearing." It shows the maximum distances in a quiet place, free from reflections, at which called numbers are interpreted by persons having various amounts of hearing loss.

In any hearing test each ear must be tested separately. A common source of error in making hearing tests is failure to exclude or mask effectively the better ear if its acuity is much greater than that of its mate. We would point out the fact that merely closing the canal of the other ear with the finger is not sufficient when testing the worse

with sounds louder than the suppressed whisper and the watch. Special masking methods are used when testing with louder sounds.

A test of the relative hearing acuity for both air and bone conduction is recognized today as essential for diagnosis and treatment and for determining the type of hearing aid best suited to the needs of a person with a severe hearing loss. For this purpose, tuning forks when calibrated and carefully used are valuable, but the audiometer with both bone and air conduction receivers serves the same purpose with greater accuracy and a saving of time and patience.

TABLE I

MAXIMUM DISTANCES IN A QUIET PLACE FREE FROM REFLECTIONS FOR INTERPRETING CALLED NUMBERS BY PERSONS HAVING VARIOUS AMOUNTS OF HEARING LOSS

Hearing Loss in Sensation Units (dcb)	Average Whisper	Loud Whisper or pp Voice	mf Voice	ff Voice
0	39.5 ft.	222 ft.	1250 ft.	1⅓ mi.
5	22.2 ft.	125 ft.	704 ft.	3950 ft.
10	12.5 ft.	70 ft.	395 ft.	2220 ft.
15	7.0 ft.	39.5 ft.	222 ft.	1250 ft.
20	4.0 ft.	22.2 ft.	125 ft.	704 ft.
25	2.2 ft.	12.5 ft.	70 ft.	395 ft.
30	15.0 in.	7.0 ft.	39.5 ft.	222 ft.
35	8.5 in.	4.0 ft.	22.2 ft.	125 ft.
40	4.7 in.	2.2 ft.	12.5 ft.	70 ft.
45	2.7 in.	15.0 in.	7.0 ft.	39.5 ft.
50	1.5 in.	8.5 in.	4.0 ft.	22.2 ft.
55	.8 in.	4.7 in.	2.2 ft.	12.5 ft.
60	.....	2.7 in.	15.0 in.	7.0 ft.
65	.....	1.5 in.	8.5 in.	4.0 ft.
70	.....	.8 in.	4.7 in.	2.2 ft.
75	.....	.....	2.7 in.	15.0 in.
80	.....	.....	1.5 in.	8.5 in.
85	.....	.....	.8 in.	4.7 in.
90	.....	.....	.....	2.7 in.
95	.....	.....	.....	1.5 in.
100	.....	.....	.....	.8 in.
110	.....	May be reached by speaking tube		
115	.....			
120	.....	Totally deaf		

Man is generously endowed by nature with a hearing acuity materially in excess of his requirements for the ordinary contacts of civilized life. This physiological factor of safety makes it possible for an individual to lose a very considerable amount of hearing acuity without being aware of the deficiency or without its detection by others. This often leads to long neglect of chronic and recurrent ear affections resulting in some cases in irreparable hearing impairment and speech defects.

Today, as a result of extensive tests by modern methods, we know that even a slight hearing loss may cause in the school child retardation, speech defects, an inferiority complex and behavior problems. The real cause of these conditions is frequently unsuspected by both parents and teachers. Retardation occurs more than three times as often in aurally defective children as among those with normal

hearing. Dr. G. Oscar Russell has shown that the incidence of speech defects is eight times as great among those with a hearing loss as among normal hearing persons of the same age. We have found that hearing deficiencies occur among rural school children with much greater frequency than among city children who have the benefit of better school health service. These findings indicate the urgent need of extending the school health program to include accurate hearing tests of rural school children.

Legislation effectively providing for modern hearing tests of all school children and for instruction in speech reading and speech correction have been passed recently in New York and Pennsylvania. In California and Oklahoma laws have been enacted to meet the needs of the hard of hearing and the speech defective child. In other states bills having a similar purpose are under consideration.

TABLE II

RELATIVE PHONETIC POWERS OF THE FUNDAMENTAL SPEECH SOUNDS AS PRODUCED BY AN AVERAGE SPEAKER

ɔ	(haul)	680	u	(rule)	310	tʃ	(church)	42	k	13
a	(father)	600	ɪ	(tin)	260	n		36	v	12
ʌ	(but)	510	i	(greet)	220	dʒ	(judge)	23	ð (this)	11
æ	(fat)	490	r		210	ʒ	(azure)	20	b	7
o	(go)	470	l		100	z	(haze)	16	d	7
ʊ	(full)	460	ʃ	(ship)	80	s	(ace)	16	p	o
e	(fame)	370	ŋ		73	t		15	f	5
ɛ	(get)	350	m		52	g	(go)	15	θ (thin)	1

Even a slight hearing impairment causes speech defects such as omissions, substitutions and transpositions of consonants and, to a lesser degree of vowels, as is clearly indicated by Table II, also from Fletcher. This shows the relative phonetic powers of the fundamental speech sounds.

Unless the young child correctly hears the less dynamic elementary speech units he cannot correctly repeat them. Thus a child having a relatively slight hearing loss early in life often suffers greater speech distortion than a child having a much greater loss later in life.

It is the general belief that hearing deficiency is not a cause of stuttering. We would suggest that further study of the subject by modern methods may disclose the fact that the emotional disturbances resulting from frustration, anxiety and fatigue incident to prolonged effort to hear may bear some causal relation to stuttering.

From an otological standpoint the most important factor to be considered with respect to hearing in relation to defects of speech is the early discovery and prompt correction, if possible, of an existing or potential hearing deficiency. It is relatively easy to disclose a profound deafness in the infant or young child by observation and by the cochleopalpebral test and conditioned response methods. It is more difficult, however, to determine accurately the degree of loss.

The instrument most widely used in screening school children to disclose hearing defects is the 4-A or phonograph audiometer recently superceded by the 4-B instrument. Its use offers the advantages of much greater accuracy and economy of time than the older methods.

Groups numbering up to forty persons are tested simultaneously, provided they can write to dictation. Children of kindergarten age and those of the first two grades and the blind are tested in smaller groups by the same instrument with the assistance of older persons who write the numbers heard and whispered by the children.

The disadvantages of this instrument are its initial cost and its limited intensity range. It is not an instrument of precision and thus is not suitable for diagnostic purposes. It does not reveal deficiencies for the higher frequencies which are necessary for the perception of consonant sounds. Its usefulness for the rapid, economical screening of large groups, when used strictly according to the operating instructions, is unquestioned.

Apparent discrepancies in the data obtained by its use in different communities are not entirely avoidable. They are due largely to faulty methods of application, including disregard of the noise level, failure to adopt a uniform standard for differentiating between children having a significant deficiency from those with normal or practically normal hearing, and to the lack of a standard method of grading the test papers.

On the basis of the medical history recorded at the time of making the tests, and the audiometer findings, as confirmed by the 2-A audiometer or a similar instrument, children found to have a significant loss are recommended for medical and otological examination.

As the result of extensive clinical observation it is known that a large percentage of all cases of acquired deafness are preventable by early discovery and prompt corrective treatment; also that many cases of a serious hearing handicap first noticed in adult life are traceable to upper respiratory infections in childhood.

There has long prevailed among the laity and many physicians, a deepseated, cruel defeatist or do nothing attitude toward diseases of the ear resulting in progressive hearing loss, regardless of the type or cause. In the light of increasing otologic knowledge this dangerous fallacy is giving way to the more reasonable view which demands that all possible causes of increasing hearing impairment, be they local, general or occupational be discovered early and be promptly removed or avoided. Research has shown that many disorders of the ear producing defective hearing are caused by disease or disturbed function in parts of the body other than the ear itself, a new thought even to some physicians, which should be given wide publicity.

A large number of adventitiously deafened individuals, both children and adults, possess some usable residual hearing power. In residential and day schools for the deaf the hearing loss of one-third of the pupils is such that when supplemented by a modern hearing aid and acquired skill in lipreading, or visual hearing, this remnant of hearing becomes a priceless asset in learning and retaining correct speech and in fitting the individual for life's contacts and responsibilities.

It is especially important that the pupils in schools for the deaf be protected from upper respiratory infections and contagious diseases which often cause further hearing loss. In many residential schools for the deaf the facilities for isolation are very inadequate.

Because the conservation of residual hearing is often a question of preserving one's general health, hard of hearing persons at all ages should have the guidance of a qualified physician or oltogist who is seriously interested in their hearing problems.

Great improvements in electric hearing aids are being made with surprising rapidity. It behooves all who are actively interested in speech correction and in the amelioration of the condition of the hard of hearing to keep informed as to progress in this department of electro-acoustics.

Among recent advances in this field the most important is the development of selective amplification, by which the component units of a portable carbon microphone hearing device, of variable amplifying power at different pitches, are assembled in such combination as will best meet the special requirements of the individual as shown by his audiogram. Thus the most commonly used hearing aid is given a wider range of usefulness among persons previously unable to be helped by this type of hearing device. In selected cases these wearable individual aids should be more generally prescribed for children with a handicapping hearing loss for home and school use.

Many persons having a severely handicapping deafness involving especially the higher frequencies cannot be helped by the usual carbon microphone type of hearing aid. These individuals find the greatest satisfaction in the use of vacuum tube instruments with their greater amplification and fidelity in reproducing speech. These instruments are being greatly reduced in size and weight making them more wearable. Vacuum tube outfits with multiple head phones are being used to great advantage in many schools for the deaf f[illegible] group instruction and speech correction. Lack of funds prevents their universal adoption.

In closing, we would reiterate that during the past few years very significant advances have been made in electro-acoustics and in otologic practice which should be helpful in advancing the science of speech correction.

The following conclusions seems to be warranted:

1. Every speech-defective child should be given a hearing test, preferably with a 2-A audiometer or its equivalent.

2. Every speech correctionist should have a satisfactory course in the fundamental principles of testing the hearing, with special reference to its relation to speech. Such courses already are being given in certain institutions.

3. Speech departments in universities and teachers colleges should should emphasize the importance of early correction of speech of hard of hearing children.

4. Every speech department should encourage the establishment of lipreading and the making of regular, periodic hearing tests as an important feature of the educational program of its respective state.

5. The realization of these ideal provisions can be accomplished only through an effective campaign of education among physicians, educators and parents. By closer co-operation of speech pathologists and otologists we may expect an earlier attainment of this double goal, conservation of speech and conservation of hearing.

VIè CONGRES
de la
SOCIETE FRANCAISE DE PHONIATRIE

25 OCTOBRE, 1938

Présidence de Mr. le Professeur LEMAITRE

RAPPORT: *Les troubles de la parole dans les affections du système nerveux central (les aphasies exceptées).*
par J. EUZIERE, J. TERRACOL & R. LAFON (Montpellier).

—Ce rapport a été rédigé, en intime collaboration, par deux neurologistes et un laryngologiste. Cette collaboration était indispensable pour établir les relations exactes entre les lésions des centres corticaux moteurs, des neurones cortico-bulbaires et des neurones périphériques avec les troubles des organes de la phonation.

Collaboration indispensable et qui, à tous les points de vue, doit aboutir aux mêmes heureuses conclusions que celles obtenues par le développement continu du mouvement oto-neuro-ophthalmologique dû au Professeur J. A. BARRE (Strasbourg). Enfin, les trois auteurs du rapport appartiennent à la même Faculté, et ceci était encore désirable en raison de la facilité des liaisons entre les cliniques hospitalières qu'ils dirigent.

Le plan général est le suivant:

a) *Les éléments de la parole*, ou plus exactement l'anatomie générale du système de la phonation, sont étudiés dans le premier chapitre. Les différentes étapes de l'élaboration psychique des idées, des mots, les centres corticaux moteurs, les neurones cortico-bulbaires, les neurones périphériques et le rôle des systèmes cérébelleux et extra-pyramidal, sont successivement envisagés et trois schémas illustrent le texte.

b) *La séméiologie générale* étudie les troubles imputables aux perturbations du temps psychique, les troubles imputables aux perturbations du temps mécanique et les troubles imputables aux perturbations statiques des organes de la phonation.

Ces divisions sont intéressantes car elles permettent de dissocier des troubles qui, le plus souvent, sont réunis; il en résulte une confusion encore plus grande, si cela est possible, dans une question délicate.

c) Le troisième chapitre rassemble par catégories localisatrices les troubles de la parole observés et décrits dans les principales affections du système nerveux central.

La première catégorie étudie les troubles dans les lésions bulbaires et protubérantielles; la seconde dans les processus médullaires étendus à la région bulbaire; la troisième dans les lésions pédonculaires; la quatrième dans les lésions des hémisphères cérébraux; la cinquième dans les lésions cérébelleuses et la sixième dans la paralysie centrale.

Enfin, dans ce chapitre ont été envisagés les troubles fonctionnels (maladie des tics, hystérie, bégaiement névropathique, etc.).

Ces notions posées, il était nécessaire d'en établir la synthèse et d'en tirer des conclusions générales. Cette synthèse est utile pour dresser un plan d'examen car ce plan varie selon chaque cas.

Les auteurs envisagent les formes cliniques (dysarthries pures ou dysarthries associées), résument dans un tableau l'essentiel des notions et enfin, tracent le plan de la conduite du diagnostic.

Ce rapport, qui contient les principaux éléments de la question, est une mise au point synthétique des éléments de liaison entre le neurologiste et le phoniatrie, en vue de la solution de problèmes difficiles. Il marque un point de départ intéressant dans un nouveau champ d'études: *la neuro-phoniatrie.*

Discussion.

M. De Parrel estime que le rapport de MM. Euzière, Terracol et Lafon mérite beaucoup d'éloges, parce qu'il a mis de l'ordre dans un sujet très complexe, et qu'il peut servir de plate-forme de départ pour de nouvelles explorations psycho-neuro-phoniatriques.

Il regrette que les aphasies et les troubles psycho-neuro-moteurs dans les bégaiements n'aient pu être développés. De plus, il se rend compte de la difficulté qu'on peut avoir à se mettre d'accord sur la signification exacte de certains termes techniques. En particulier, il propose de définir la dysphasie: "la difficulté et l'altération de la fonction du langage sous l'influence de lésions des centres cérébraux." Et la dyslalie: "un trouble de la parole d'origine périphérique soit par malformation ou déformation des organes de l'articulation ou des cavités de résonance, soit par habitude vicieuse contractée dans l'enfance sous l'influence d'un défaut de surveillance ou d'un mauvais exemple des parents, soit par insuffisance ou perturbation du contrôle de l'ouïe."

M. Pichon pense, comme M. Terracol, qu'il est indispensable que les oto-rhino-laryngologistes, les neurologistes et les psychiatres collaborent pour l'élaboration de la science phoniatrique.

Il oppose aux conceptions de Cossa sa propre doctrine des fonctions linguistiques. Les idées ne préexistent pas toutes faites au langage; il les élabore; il est un mode de pensée; c'est là la fonction ordonnatrice, que déclanche la fonction appétitive (tendance à parler) et qu'extériorise la fonction réalisatrice.

Ces vues, superposées aux données neurologiques et rhino-laryngologiques, fournissent une classification des troubles de l'élocution ou dysphémies en troubles du langage (dysnoïques, dysorectiques, dyslogiques, dyschrestiques) et troubles de la parole (dysropiques, dystoniques, dyssynergiques, dysergaliques).

M. Pichon termine par des considérations sur le sens et l'emploi des mots *phonologie, dyslalie* et *anarthrie.*

M. NADOLECZNY-MILLIOUD pense que, si l'on veut employer le terme d'anarthrie, on peut dire qu'elle est le dernier stade de la paralysie bulbaire progressive, c'est-à-dire la phase où le malade n'a plus la faculté d'articuler.

Il indique toute la valeur de la phonétique expérimentale dans le diagnostic de la myasthénie. L'enregistrement des courbes pneumographiques pendant l'émission de la voix révèle très sûrement le syndrome de fatigue de la myasthénie.

Il ajoute qu'on peut attribuer aux dyslalies la valeur d'un syndrome périphérique, car bien des enfants parlent mal, non par faiblesse d'articulation, mais par trouble central.

COMMUNICATIONS

—*La vibration des cordes vocales dans les affections organiques centrales.*—M. HUSSON (Paris), en collaboration avec le Dr. André Ombredane, a examiné la vibration des cordes vocales, à l'Hospice de Bicêtre, dans le service du Professeur Alajouanine, d'une trentaine de sujets atteints d'affections centrales unilatérales diverses.

Ses conclusions sont les suivantes:

1°) En cas d'atteintes corticales, la corde hétérolatérale ne vibre plus et se situe à un niveau inférieur à celui de la corde opposée.

2°) En cas d'atteintes bulbaires ou situées à un niveau inférieur, la corde vocale homolatérale paraît immobile au stroboscope, mais vibre encore à une fréquence moindre et de façon irrégulière, en se situant plus bas que la corde opposée.

Ces faits confirment la théorie neuro-chronaxique de la vibration des cordes vocales émise par l'auteur en 1937, et qui attribue la vibration à un phénomène de physiologie nerveuse pure.

Discussion.

M. TARNEAUD rappelle qu'il a décrit deux cas de paralysie bilatérale de la vibration des cordes vocales. Alors que tous les mouvements musculaires étaient normaux, seule manquait la vibration, et ces deux cas se rapportaient à des atteintes cérébrales. La clinique montrerait donc, au point de vue de la phonation, l'existence de deux centres, l'un des mouvements moteurs et l'autre des mouvements vibratoires.

—*Mue de la voix et macrogénitosomie précoce.*—M. CALVET (Toulouse) rapporte le cas d'un enfant âgé de 4 ans mesurant 1 m. 30, pesant 32 kilos, qui réalisait au grand complet le syndrome de Pellizzi et qui, notamment, présentait une mue anormale de la voix. Le larynx était complètement évolué, l'épiglotte au lieu d'être du type infantile était relevée, la glotte était largement ouverte et les cordes vocales larges et épaisses rappelaient tout-à-fait un larynx d'adulte.

Discussion

M. NADOLECZNY-MILLIOUD rapporte une observation similaire d'une petite fille de quatre ans; le diagnostic porté fut celui de tumeur des ovaires.

—*Tic respiratoire.*—M. NADOLECZNY-MILLIOUD (Munich) rapporte l'observation d'un enfant de 8 ans ½ qui présentait de véritables accès convulsifs des muscles mimiques et respiratoires, accompagnés de ronflements, et qu'il a pu étudier dans des courbes respiratoires thoracale et abdominale. L'enfant donnait l'impression d'un malade très gravement atteint. Les crises étaient plus fortes et fréquentes lorsque le malade était seul, moins fortes quand on s'occupait de lui. Aucun traitement n'a réussi, la maladie a duré quatre ans et a guéri d'ellemême.

—*La tomographie. Son intérêt dans le traitement des paralysies récurrentielles.*—MM. CANUYT & GREINER (Strasbourg) présentent des tomographies de larynx atteints de paralysies récurrentielles uni et bilatérales. Cette nouvelle méthode permet de poser les indications du traitement rééducateur, d'en suivre les effets et d'en contrôler les résultats.

D'autre part, ces coupes radiographiques font comprendre le mécanisme de la récupération vocale en montrant les changements de l'image laryngée sous l'influence des manoeuvres digitales externes.

—*Note sur les dysphonies et les dyslalies d'origine auditive (techniques rééducatives).*—MME. MATHA (Paris) traite des troubles de la parole et de la voix provoqués par les dysacousies méconnues consistant en lacunes du champ auditif (hypoacousie zonale), en perversions acoustiques (paracousie tonale, dystonacousie, désorientation auditive), en suraudition et résonance exagérée (hyperacousie), en retard de la transmission sonore et de l'interprétation mentale (bradyacousie), etc. Elle rapporte quelques observations typiques et les complète par le présentation d'enregistrements sonores.

A tous ces dyslaliques et dysphoniques d'origine auditive, l'auteur conseille d'appliquer, en plus des procédés habituels d'orthophonie, les techniques de rééducation acoustique consistant en exercices au tube acoustique, en massages sonores, en massages externes, en exercices d'attention auditivo-mentale, en entraînement méthodique des muscles de la face, etc. Les résultats obtenus prouvent l'utilité de cette méthode et confirment la part de responsabilité des perturbations acoustiques méconnues dans la genèse de certains troubles de l'émission vocale ou de l'articulation.

A noter que certains troubles vocaux de surmenage ou de défaut de justesse observés chez les professionnels de la voix peuvent être engendrés par des dysacousies méconnues.

Discussion

M. DE PARREL insiste sur la valeur des observations présentées. Les sujets dysphoniques ou dyslaliques doivent être soumis à un examen minutieux du champ auditif. En cas de déficit de l'ouïe, la rééducation acoustique par les procédés habituels est nécessaire.

MME. BOREL-MAISONNY rappelle les travaux mémorables de l'Abbé Rousselot sur cette question. Elle pratique elle-même la rééducation acoustique en s'efforçant de donner aux sujets une per-

ception plus correcte et rapide dans le domaine du timbre, de la hauteur, du rythme et du nombre, et a ainsi obtenu des améliorations certaines.

—*Mouvements du voile du palais* (*démonstration d'un film sonore*).—M. NADOLECZNY-MILLIOUD (Munich) présente un film sonore se rapportant à l'observation des mouvements du voile du palais pendant la déglutition et la phonation. Ce film a été pris chez un opéré de cancer du maxillaire et, à travers une large ouverture chirurgicale, on distingue les mouvements du voile du palais et les parois du pharynx nasal pendant la déglutition et la parole; il démontre le rôle important des muscles latéraux du pharynx dans le soulèvement du voile.

Discussion.

M. LEMAITRE souligne la valeur du symptôme précisé par M. Nadoleczny-Millioud se rapportant à l'augmentation ou à la diminution de la rhinolalie par la rotation de la tête, en présence d'une hémiplégie vélo-pharyngée.

—*Mécanisme musculaire de la respiration.*—M. LABARRAQUE (Paris) présente un exposé nouveau des phénomènes mécaniques de la respiration, basé sur: a) l'action directe de la volonté sur les muscles thoraco-abdominaux; b) la critique de l'antagonisme fonctionnel des muscles inspirateurs et expirateurs; c) l'action automatique et instinctive du diaphragme; d) l'atténuation de l'intervention des inspirateurs; e) l'importance du point d'appui des forces musculaires sur la colonne vertébrale.

Il divise les muscles respiratoires en deux groupes: le premier, postérieur, servant de point d'appui aux forces expiratoires et inspiratoires; le second, antéro-latéral, assurant les actes inspiratoires et expiratoires.

Il importe de répartir le même effort respiratoire sur un plus grand nombre de muscles, d'élargir les cavités thoraciques et abdominales là ou elles offrent le maximum de souplesse et de largeur. Ce mécanisme, constitué par des muscles volontaires, peut être facilement acquis; il lutte contre toutes les gênes inspiratoires ou expiratoires pathologiques, supprime les contractions excessives de la région cervicale, le gonflement ou les stases veineuses des jugulaires.

Il est beaucoup plus adapté, comme geste respiratoire, que celui qui est prôné habituellement dans les centres de culture physique.

JEAN TARNEAUD.

BOOK REVIEWS

By CHARLES H. VOELKER
Director, Dartmouth College Speech Clinic

ON RECEIVED PRONUNCIATION. By DANIEL JONES. *Supplement to Le Maître Phonétique*, April-June, 1937.

"When I teach foreign students, I am naturally obliged to teach the pronunciation I use myself, or something near to it. It would be inconvenient for me to teach anything else. . . . It is likewise reasonable that other teachers should teach their own pronunciation. . . . At present teachers are, however, sometimes hampered by lack of books recording a pronunciation sufficiently near to their own. Received Pronunciation is well provided for in the way of books; teachers using other types of speech should be encouraged to increase the number of textbooks illustrating those types."

HISTORICAL ASPECTS OF BONE CONDUCTION. By N. H. KELLEY (State University of Iowa). St. Louis: *Laryngoscope*, 47:102-109 (February) 1937.

Phillipus Ingressa (1510-1580) reported bone conduction in 1602 (post mortem). Hieronymus Capivacci made the first application of bone conduction to hearing testing (1589). Shellhammer proved that the placing of a rod at the teeth was heard by bone conduction rather than through the Eustachian tube (1684). Kelley continues to discuss the anatomical discoveries concerning the ear and later experimental discoveries on bone conduction down to the audiometer. The testing device in 1860 was the watch but Conta in 1864 emphasized the use of tuning forks and in the eighties Schwabach developed his test. In 1925 Fowler showed that in the ear occluded, the threshold of bone conduction was lowered by 14 to 16 sensation units. He used a 256~ fork with a known damping constant. Using a vacuum tube oscillator, Pohlman and Kranz found this to be true from 128 to 1024~, but not at 2048~. Knudson and Jones found this increased acuity for bone conduction when the canal was filled with wax to be 10 db. in a soundproof room. Dean reported the forehead-mastoid decrement at 362-2048~ to be 3 to 8 db. Bibliography.

THE CORRECTION OF DEFECTIVE CONSONANT SOUNDS. By E. M. NEMOY and S. F. DAVIS. Boston: Expression Company, pp. 425, 1937, $4.00.

This book is a teachers' manual or ear training stories and motivated lessons for group or inidvidual instruction. It is arranged into

well graded cumulative and non-cumulative habit formation syllable word, and connected speech drills. The volume has been evolved from actual experience in the classroom and experience in supervision of teacher training. *Part I* (20 pages) discusses *The Mechanism of Speech*, exercises for *Gaining Control of the Mechanism of Speech*, and *The Sounds of Speech. Part II* (150 pages) is devoted to a *Detailed Discussion of Each of the Consonant Sounds*, with exercise directions. *Part III* (228 pages) is a *Presentation of Ear Training and Practice Material for Each of the Consonant Sounds.* There is a well selected bibliography and index. This book will have wide popularity.

FEEDING BEHAVIOR OF INFANTS. By A. GESELL and F. L. ILG (Yale University). Philadelphia: J. B. Lippincott Company, pp. 201, 1937, $4.50.

Phoniatrists are quite concerned with diet and feeding behavior today in relation to speech development, and ontogenetic phonetics always starts with oral responses. Speech workers will find the sections on lip and mouth behavior much to their interest. "This enormous metabolic apparatus, the digestive system, is intimately bound up with associative organ systems, not only the vegetative and endocrine, but the sensori-motor and the symbolizing nervous structures. Touch, taste, smell, lips, tongue, eyes, hands, posture, emotion and even speech—all prove to have vital relations to the fundamental physiological interior. Although the alimentary tract is racially the oldest part of man's anatomy. it has always preserved an articulation with his higher organization." The book will prove particularly interesting to those who are studying the functional development of the phonetic architecture of the nervous system. Drs. Gesell and Ilg have a clever pen.

Some of their trenchant observations: "The first permanent molar erupts at the age of six and punctuates the end of the preschool period. The next six years bring the child to the teens—and to his second molars. At 18 years he has half completed his adolescence. His wisdom tooth erupts at about 24 years. In a broad biological sense, these four sexennia constitute the total span of infancy. It takes the human a long time to complete his dental equipment, to attain his full masticatory strength, and to establish his eating habits." The two hundred illustrations and the bibliography are quite valuable.

CHILD PSYCHIATRY. By L. KANNER. Springfield: Charles C. Thomas, Pub., pp. 527, 1937, $6.00.

This is undoubtedly the outstanding book in its field. To one who has found as much use for the book as I have, a review might sound like a long list of praiseworthy adjectives. The book is a combination of pediatric and psychiatric approach. No one theory is adhered to and this alone makes it especially valuable to the speech corrective field. Phoniatrists in private practice are interested in results and think of theory afterwards—speech pathologists in

academic circles try out various techniques regardless of theory just to better understand each disorder. In addition to dealing directly with speech disorders, the book is most complete, treating: *The Prevailing Methods of Studying and Handling Children's Psychiatric Problems, The Principles of an Objective Psychobiology and Psychopathology of Childhood, Psychiatric Case Record, The Complaint Factor, The Age Factor, The Somatic Factor, The Intelligence Factor, The Emotional Factor, The Sex Factor, The Constitutional Factor, The Environment Factor, Diagnostic Synthesis, General Therapeutic Considerations, Work With the Child, Work With the Family, Work With the Community, Specific Therapeutic Aids, Follow-up Work, Anergastic Reaction Forms, Dysergastic Reaction Forms, Sydenham's Chorea, The Endocrinopathies, The Central Nervous System, The Digestive System, The Circulatory System, The Respiratory System, The Urinary System, The Muscular System, The Special Senses, Intellectual Inadequacy, Emotional Disorders, Thinking Difficulties, Habitual Manipulations of the Body, Faulty Feeding Habits, Sleep Disturbances, Antisocial Trends, Sexual Difficulties, The Attack Disorders, The Minor Psychoses, The Major Psychoses*, and *Children's Suicides*. Indexed.

MODERN DISCOVERIES IN MEDICAL PSYCHOLOGY. By C. ALLEN. New York: The Macmillan Company, pp. 280, 1937, $2.75.

In discussing the history of the handling of psychopathies, Allen considers Mesmer, Janet, Morton Prince, Freud, Adler, Jung, Kretschmer, and Pavlob. "Although the subject matter is strictly accurate, the language is so plain and the explanations so clear that the book should be intelligible to all." The author attempts to describe rather than argue the several points of view. It is very pleasureable, at long last, to have a book on this subject, to which we can refer students, and feel confident that it will not make them fussy, intolerant, and biased before they are matured enough to have that right, and before they have seen enough cases to make their judgments objective. In this light, speech pathologists should find considerable use for this book.

PHONETIC STUDIES IN FOLK SPEECH AND BROKEN ENGLISH. By A. DARROW. Boston: Expression Company, pp. 113, 1937, $1.60.

Some phoniatrists are what might be called phonetic directors in dramatic productions and an analysis of our membership reveals a goodly number who are simultaneously out and out drama teachers in addition to their speech correction interests. For these people Darrow's book will prove a very convenient source-book for brogues. In spite of arousing our suspicions in the early pages of the book by complimentary references to the author, the rest of the material is practical and useful and could stand on its own merit. The I. P. A. transcriptions will be easily understood by anyone. The author persists in using some rather fanciful orthoepy even after introducing

phonetic symbolization, and probably has her own reasons for doing this. Nevertheless, no pronunciation in the book is listed without definite reference to I. P. A. script. The brogues considered are: Irish, Scotch, Cockney, British, Negro, Jewish, German, French, Italian, and Scandinavian. The book also will serve a further use in our field. Even though phoniatrists are loathe to admit it, they are forced to branch out and do what could be called speech improvement work and take up the elimination of the peculiar in dialect toward a more general type of pronunciation. This material, if handled in reverse order, could contribute to that branch as well as to work with barbaralalia.

SUPERIOR CHILDREN. By J. E. BENTLEY (American University). New York: W. W. Norton & Co. Inc., pp. 331, 1937, $3.00.

Speech defectives in a college or university class are on the whole superior to their classmates and speech correctors working in higher education circles should find this book pertinent. Bentley is quite an appropriate man to write for us on this subject since only last year he discussed the speech defectives themselves in his book on *Problem Children.* The present volume has a wealth of bibliography. Its chapters are: *The Superior Child, Aims and Objectives in the Education of Superior Children, The Physical, Mental, Social and Moral Qualities of Superior Children, The Psychological Theory of Gifted Children, Special Abilities and Talents, Precocity, The Gifted Girl, The Diagnosis and Discovery of Superior Children, Educational Provisions for the Instruction of Superior Children, The Teacher of Superior Children, The Problem of Discipline and Social Adjustment, Educational Usages, Past and Present, The Childhood and Youth of Six Great Men, Leadership Through the Adequate Education of Superior Children,* and *Genius.*

CORRECTION OF SPEECH DEFECTS OF EARLY CHILDHOOD. By S. D. ROBBINS and R. S. ROBBINS. Boston: Expression Company, pp. 67, 1937, $1.00.

Phoniatrists have long felt the need for a book at the level of young children which could be used for explanatory description and exercise material by parents of speech defectives between clinic attendances. This book will be a boon to those who have devoted fifteen to twenty minutes of each treatment hour to the writing out of exercises to occupy the patient for the three or four days between clinic appointments. The book has a good format and is priced for wide use. Robbins' wide experience makes him and his co-author well qualified to write the book. In addition to the exercise materials which are arranged for progressive speech improvement, the discussion material describes speech defects due to *Mental Deficiency, Deafness, Structural Anomaly, Paralysis or Weakness of Speech Muscles, Poor Sound Discrimination, Short Auditory Memory Span, Imitation,* and *Hyperemotionality;* and defines the following speech disorders: *Delayed Speech, Invented Language, Cluttering, Cleft-Palate Speech, Foreign Dialect, Lack of Head Resonance, Nasal Voice,*

Functional Hoarseness, Stuttering, Pseudo-Stuttering, Lisping and *Sound Substitutions.* Some academicians may scoff at the book's simplicity but those of us who have been in private practice realize the necessity for this.

BETTER SPEECH AND BETTER READING. By L. D. SCHOOLFIELD (Department of Speech Correction, Elementary Schools of Washington, D. C.). Boston: Expression Company, pp. 218, 1937, $1.25.

Here is a book of vowel and consonant exercises, articulation test materials, tongue and lip exercises, drill words, practice sentences, and entertaining and natural poems. In an excellent format, and written within the comprehension of the elementary pupil. The author employs standard orthoëpy but the material's arrangement is based on I. P. A. symbols. The book is of great value in the speech clinic, reading clinic, for lip reading and deaf articulation, as well as for ordinary children. It will also be of great held to parents of speech defectives between clinic treatments.

THE REHABILITATION OF SPEECH. By R. WEST, L. KENNEDY, and A. CARR. New York: Harper & Brothers, pp. 475, 1937, $4.00.

Everyone should review this book for himself. It will immediately take its place among the outstanding works in our field, and give phoniatry a firmer foundation. *Part I* on speech pathology is an objective and critical description of the whole province of disorders of speech, and the other half of the book gives very clear and highly valuable therapeutic techniques, which the clinician will find indispensable. These corrective procedures demonstrates the vast experience of the authors in dealing with actual cases, and not only tell exactly how, but give ample practice material and employ precise phonetic symbolization. The drill work is linked to the diagnosis by means of the very practical trouble shooting chart on pp. 185–186. There is material on tests, examination methods, a glossary, collateral readings, and an index.

STUDIES IN THE EYE MOVEMENTS OF GOOD AND POOR READERS. By I. H. ANDERSON. (in Tiffin—Studies in the Psychology of Reading Vol. 10). Princeton: *Psychological Monographs*: 48: 1–35, 1937.

When reading for the general idea only, the good readers made their most regular eye-movements, but the poor readers showed irregular eye-movements. When reading for the purpose of remembering all the details both groups made their most irregular eye-movements, and the differences between good and poor readers were less significant. The purpose in reading is more important than the difficulty of the material. An essential difference between good and poor readers is the better ability of good readers to adapt their reading to different purposes. The mean size of fixation was found to be the most valid

single measure of eye-movements and can be considered the only clinical test necessary. Intelligence correlates as well with eye-movement measures as with reading ability scores, but pedagogically those of low intelligence profit more by training which emphasizes careful and detailed reading rather than exercises designed to increase the regularity of eye-movements. Both good and poor readers are influenced by the difficulty of the material but the good reader has greater flexibility in adjusting to the type of material psychologically.

PITCH: ITS DEFINITION AND PHYSICAL DETERMINANTS. By D. LEWIS (State University of Iowa). Iowa City: University of Iowa Studies in the Psychology of Music, Vol. IV, *Objective Analysis of Musical Performance* (C. E. Seashore, Editor), pp. 346-373 (February) 1937.

After defining pitch Lewis takes up: *Lower and Upper Frequency Limits of Tone, Pitch: A Psychophysical Variable, Pitch as a Function of Frequency, The Measurement of Pitch, Pitch as a Function of Intensity, Pitch as a Function of Harmonic Structure, Pitch as a Function of Duration,* and *The Pitch Element in Speech.* 31 references.

STUDIES IN INFANT SPEECH AND THOUGHT, PART I, THE DEVELOPMENT OF SENTENCE STRUCTURE IN INFANCY FROM THE VIEWPOINT OF GRAMMAR. By A. A. Low (University of Illinois Department of Neuropsychiatry). Urbana: University of Illinois Medical and Dental Monographs, Vol. 1, No. 2, pp. 71, (May) 1936, $1.00.

Low has made a quantitative analysis of the speech of three infants over a two years, three months, period in which the children were at the beginning of the study (1) one year and two months, (2) two years and eight months and the third who was the only girl, at three years of age. The 25,000 utterances were collected by the mothers. After a historical introduction, Low discusses *Auxiliary Verbs, Pronouns, Progressive Pronouns, Demonstrative Pronouns, Prepositions, Adverbs, Conjunctions, Negation, Articles, Infinitive Particles, Plurals and Clauses.* There is a bibliography of 41 items.

THE LOCALIZATION OF SOUND. By H. E. O. JAMES. Reports of the Committee upon the Physiology of Hearing of the Medical Research Council, III; London: His Majesty's Stationery Office, pp. 38, 1936, 9d.

This is an investigation and comparison of monaural and binaural attunement, and of the effect upon auditory localization of intensity differences between the right and left. "It is demonstrated that the disturbance of localization due to attunement increases: (a) with increase in the loudness of the attuning sound; (b) with increase in the duration of the attuning sound; (c) with increase in the angular deviation of the attuning sound; and it is shown what degree or order of disturbance can be expected in all these cases. Also it is proved that attunement can occur equally with tones and with noises; but

that the effect is small in the case or tones if there is any marked difference of pitch between the attuning sound and the one which is subsequently localized."

A METHOD OF STUTTERING. By B. BRYNGELSON. *Journal of Abnormal and Social Psychology*, 30:194–198 (July-September) 1935.

"Voluntary Stuttering" is a method of adjusting the stutterer to his speech spasms and to enable him to gain more control over his speech. The first sound in each word should be repeated clearly and distinctly several times. The number of repetitions at the beginning of words should be varied to avoid establishment of a set speech pattern. Whenever the stutterer has a spasm while using voluntary stuttering, he should repeat the word using voluntary stuttering, until he can say the word without difficulty. In longer words voluntary stuttering can be practiced on each syllable. After the stutterer masters the technique through practice before a mirror, he should employ that type of speech not only in the classroom but also in every outside situation.

SIDEDNESS AS AN ETIOLOGICAL FACTOR IN STUTTERING. By B. BRYNGELSON. Worcester: *Journal of Genetic Psychology*, 47:204–217 (September) 1935.

Stutterers are not as often like right-handed persons in many types of behavior as they are like the left-handed individuals. In a group of 700 stutterers, 57% were left-eyed (25% is normal), 10% were amphiocular (5% is normal), 61% were ambidextrous (5% is normal), 80% wrote mirror script (15% is normal). In a group of 107 stutterers, 50% had reading, spelling, and writing disabilities (26% is normal). 55% of 162 stutterers were shifted to the left side and 45% tied-up with the right side, with satisfactory results. In 700 cases, the diagnosis indicated: 74% for shift to the left, 28% for shift to the right, 25% for tie-up to the right, and 42% for tie-up to the left. Diagnosis is made on sidedness, not handedness

AN EYE-VOICE CAMERA FOR CLINICAL AND RESEARCH STUDIES. By J. TIFFIN and G. FAIRBANKS. (in Tiffin—Studies in the Psychology of Reading). Princeton: *Psychological Monographs*, 48: 70–77, 1937.

The apparatus primarily gave three measures, an eye-movement graph for the two eyes and a voice record. These three measures were run simultaneously on the same film so that temporal relations were maintained. The eye-movements were made by adapting the ophthalmograph. The voice record was made from Stoelting's Dorsey phonelescope in synchronization. Also there was a device reflecting a 60 cycle light beam from spectacles worn by the subject which was recorded on the same film and served the double purpose of demonstrating head movements and time recording according to the number of light interruptions.

SPEECH PROBLEMS AND SPEECH CARE. By B. BRYNGELSON. Chicago: *Hygeia*, October, 1935.

If a child has not established an intelligible speech pattern by the age of four, it is time to consider the matter seriously; this applies to stuttering speech. The causes of speech disorders can be classed as hereditary, congenital and developmental. "A speech sound is a unit made up of movements of all speech muscles functioning as a whole. We do not learn our mother tongue by first knowing the position of our speech organs in sound production but through the process of hearing sounds spoken by those about us. A child, then, who is defective in certain sounds possesses a debility either in the ear or in that part of the brain in which auditory speech patterns are recorded. Obviously, one is not attacking the source of the deficiency in speech by drilling the peripheral speech muscles. Rather, one should first be sure that the hearing is intact and should then proceed to exaggerate the hearing act by stimulating the child with speech sounds. After the sound has been learned, the child can practice it."

STUDY OF THE PUPILLARY REFLEX WITH SPECIAL REFERENCE TO STUTTERING. By W. H. GARDNER. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49:1-31, 1937.

The delicate balance between the constrictor and dilator muscles of the pupil, which are innervated by opposing branches of the autonomic nervous system is disarranged in the spasmophemiac. The normal pupillary response to light is altered consistently in dilated diameter, the various speeds and amount of contraction, and minimum diameter, when spasms are present in spasmophemoid speech.

THE RELATION BETWEEN EYE-MOVEMENTS AND VOICE IN ORAL READING. By G. FAIRBANKS. (in Tiffin—Studies in the Psychology of Reading). Princeton: *Psychological Monographs*, 48: 78-107, 1937.

Found that the errors in reading preceded the regression, that therefore the regression was not the cause of the error or poor reading, and that elimination of the regression was not therefore the correction for poor reading. The cause of the error seemed to be of central origin. The good readers compensated more frequently for the error so that it did not appear in overt vocalization but only in eye-movement regressions.

SPEECH AND MENTAL DEVELOPMENT. By D. WILSON. London: *Speech*, The Journal of the British Society of Speech Therapists, 2:11-17 (October) 1936.

Wilson describes in detail the handling of four speech cases: paraphemia prolongata, aphasis prolongata, paralalia prolongata and alogia oligophrenia prolongata. The descriptions readily differentiate the cases.

A STUDY OF THE EXTENT OF DYSSYNERGIA OCCURRING DURING THE STUTTERING SPASM. By C. STROTHER. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49: 108-127, 1937.

Voice and breathing abnormalities bear the highest temporal correlation to the overt spasm. For certain individuals, the relationship between a given type of abnormality and the overt spasm is practically perfect. It is possible that stuttering may occur without any detectable accompanying neuromuscular inco-ordinations.

A COMPENDIUM OF SOME THEORIES AND THERAPIES OF STUTTERING. By E. F. HAHN (University of Southern California). Ann Arbor: *Quarterly Journal of Speech*, 23:378-396 (October) 1937.

Hahn gives an authoritative and succinct exposition of the present day theories and treatments of spasmophemia, which are most popular and most widely used. These methodologies are represented by the names of Blanton, Travis, Bluemel, Fletcher, Greene, Gifford, Freud and Adler, Dunlap, West, and others. This paper will prove most valuable to those who teach or study phoniatry.

THE EFFECT OF PITCH AND INTENSITY ON THE QUALITY OF VOWELS IN SPEECH. By L. T. LAASE. Iowa City: *Archives of Speech*, 2:41-60 (July) 1937.

There can be considerable variation in the quality composition of the vowel without damage to its recognition. Five energy regions were found in a number of the waves analyzed. Characteristic energy regions for [i] and [u] were very similar except for a difference in amount of energy above 2000∼. Pitch or intensity differences did not result in a shift of the location of the quality energy formants. The fundamental is less intense for [a] than for [i] or [u]; in the latter it is frequently the most intense component. Pitch and intensity also react on the energy in the fundamental. If the pitch rises and the intensity remains constant, the number of quality energy regions decreases, but if the intensity increases and the pitch remains constant, the number of energy regions increases. Increase in intensity with pitch constant shifts the percentage of energy to higher partials. Increase in pitch with intensity constant reinforces the fundamental.

SPEECH DIFFICULTIES OF THE MENTALLY DEFECTIVE. By C. J. C. EARL. London: *Speech:* The Journal of the British Society of Speech Therapists, 2:7-14 (July) 1936.

Under physical factors, Earl describes the defects of the speech organs and organic nervous lesions. Under psychological factors, he discusses intellectual factors and emotional factors as well as psychological abnormality. The clinical picture shows delayed speech and echolalia, which last is a verbal symptom of the automatic obedience of catatonia. He concludes by describing the theory of treatment. This is an excellent paper well deserving of notice.

AN ACTION CURRENT STUDY OF THE CONDITIONED HAND WITHDRAWAL. By A. H. HILDEN. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49:173-204, 1937.

Handedness did not show any general relation to rate of conditioning or extension, to response latencies, to action current overt response intervals, or to response leads.

COMMON FACTORS IN EYE-MOVEMENTS IN SILENT AND ORAL READING. By I. H. ANDERSON and D. E. SWANSON. (in Tiffin—Studies in the Psychology of Reading). Princeton: *Psychological Monographs*, 48:61-69, 1937.

The analysis of difficulties in silent reading by an approach through oral reading is justified among poor readers because of the intimate relationship between the two modes of reading. On the other hand silent reading is taught usually through oral reading, but mature readers are sufficiently weaned from these habits of oral reading to permit more refined psychological functions to operate in their silent reading; thus, it becomes obvious that there is a higher correlation between oral and silent reading in the case of poor readers.

FUNDAMENTAL PATHOLOGY OF THE LARYNX. By J. D. KERNAN. St. Louis: *Laryngoscope*, 47:77-91 (February) 1937.

This paper gives detailed information on the histological pathology of the larynx. He discusses inflammations, edema, tuberculosis, syphilis, diphtheria, trauma, tumour, hematoma, polypi, fibrosarcoma, hyperkeratosis, leukoplakia, pachydermia laryngis, and malignant papilloma.

VOCAL RESONANCE. By DON LEWIS. *Journal of the Acoustical Society of America*, 8:91-99 (October) 1936.

Lewis describes an experimental procedure for studying vocal resonances and other aspects of voice and in working out this technique makes some tentative conclusions. Pitch vibrato is the only physiological vibrato; intensity and timber vibrato are acoustic. There are no fixed vocal resonators of any importance. He finds supporting evidence for Fletcher's theory that the distribution of energy among the partials of the cord-tone varies inversely as the cube of the harmonic number. He found for vowels [i], [e], [a], [o], and [u] two formants below 2400∼, and two or three above 2400∼.

AN ANALYSIS OF ASSOCIATIVE AND PREDISPOSING FACTORS IN THE SYMPTOMATOLOGY OF STUTTERING. By A. MORLEY. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49:50-107, 1937.

The influence of stuttering on measures of breathing was found to be opposite in nature to that expected in comparable breakdowns in normal speakers. Embarrassment and emotional reaction to

speech difficulty seem to be expressed in a decreased amplitude and increased duration of breathing. The decrease in eye-movement efficiency in the stutterer seems to be a reaction to difficulty in verbalization. Susceptibility of the stutterer to changes in the speaking situation is suggestive of the efficacy of a therapy which will increase his ability in social confrontation and develop within him a more objective point of view toward his disorder. Therapeutical measures of this sort may be necessary accompaniments of effort to stabilize the stutterer neurophysiologically. In some cases such therapy might enable the individual to exert successfully that degree of stability which he possesses.

AN EARLY STAGE OF SPEECH DEVELOPMENT. By E. NORMAN. London: *Speech*, The Journal of the British Society of Speech Therapists, 1:13-17 (April) 1936.

"The following material is put forward in the hope of illustrating some of the features of early speech development, as they appeared in the utterances of a little girl of a year and seven months. Her speech was observed and recorded from day to day, so many instances of the use of each word became available." Eighteen expressions are recorded. "This vocabulary is that of a child who had not passed beyond the one word sentence stage of speech. She did not use her words in sequences at all at this age. . . . The vocabulary is conspicuous for the scarcity of words relating to people and things. The child had not yet reached the name stage when objects are named with much interest and many such words learnt. This set in at the age of about a year and nine months."

THE SPEECH OF CHILDREN WITH ENLARGED ADENOIDS AND TONSILS. By B. N. OLDREY. London: *Speech*, The Journal of the British Society of Speech Therapists, 1:28-33 (April) 1936.

"The obvious course is to have the obstruction removed by a surgeon, as until this is done speech training and breathing exercises are of little value; but it is only very seldom that surgical aid alone is sufficient to restore normal voice. It is not an exaggeration to say that every case following such an operation would derive considerable benefit from a course of general speech exercises; breathing, resonance, and articulation. These should always be preceded by relaxation and this is particularly necessary in those cases where an effort has been made to keep up with other children, or where temporary deafness has brought about a state of physical and mental tension. Cases have been known where the condition of strain and the psychological state consequent upon the enlargement of tonsils or adenoid excess have been a contributing factor to the development of a stammer. It is sometimes necessary to spend several weeks training entirely on lines of relaxation before more specific exercises can be introduced." Oldrey lists several exercises and designates those for rhinolalia aperta and those for rhinolalia clausa.

APHASIA: A PROBLEM IN DIFFERENTIAL DIAGNOSIS AND RE-EDUCATION. By R. MEYERS. Ann Arbor: *Quarterly Journal of Speech*, 23:357-377 (October) 1937.

Meyers gives us a very logical neurological discussion on aphasia. He takes up *Anatomical and Physiological Mechanisms, Etiology and Differential Diagnosis of Speech Pathology, The Neural Correlates of Aphasia, Psychological Aspects of Aphasia*, and Speech Re-education. The last consideration is based on the organic cases: 1, vowel production followed by consonants; 2, practice on the whole word; 3, whole words should be monosyllable nouns or verbs; 4, without distraction single objects and occasional printed words are presented to the patient; 5, object then is presented to patient for comprehensive sensory and emotional examination and the word is pronounced frequently by the teacher; 6, the next step is single two and three word sentences; 7, then multiple choice drill is initiated using objects and finally words; and 8, the patient should be urged to reproduce words. There are certain cases where phonetic work is hopeless and other cases where speech is recovered spontaneously.

AN ELECTROMYOGRAPHIC STUDY WITH RESPECT TO SPEED OF MOVEMENT AND LATENCY, DISPARATE AND RECIPROCAL INNERVATION, ATTENTION AND RELAXATION. By B. K. BAGGHI. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49: 120-172, 1937.

It was found that, in general, the faster the speed of movement, the shorter is the latency, and up to a certain point, the slower the speed the longer the latency. It was further concluded that in the voluntary movement of the forearm of an intact organism there was no absolute co-contraction or simultaneous innervation. Rather there is co-operative innervation with a temporal lag and differential intensity on the part of the non-leading member of antagonistic muscle groups, depending upon the speed at which the postural changes are made in response to environmental demands. There is a tendency to adhere to subjective patterns, suggesting possibly a differential neuromuscular functioning at a minimal level.

SPEECH THERAPY IN CALIFORNIA. By M. F. GIFFORD (Chief of the State Bureau for the Correction of Speech Defects and Disorders). London: *Speech*, The Journal of the British Society of Speech Therapists, 1:34-36 (April) 1936.

"A survey of utmost importance to children in the State of California, especially in rural districts, is about to be undertaken; a state-wide survey of all those children who deviate from the average child to such an extent as to require special treatment or training in order to make the most of their possibilities. Workers in the field of child psychology and special education have long desired such a survey in order that they might not only ascertain the exact number of such children but also in order that they might have a basis upon

which to set up facilities for the welfare and education of these children. The survey has been made wide enough to include all types of handicapped children: the physically handicapped, the mentally retarded, those children who are suffering from speech defects and conduct disorders. Audiometers will be used in testing the hearing of children not only in the cities, but also in rural localities of the state, where such facilities have not hitherto been available." Gifford discusses the American Speech Correction Association and also displays a California annual report from sixty speech therapists who enrolled 10,942 speech defectives of which they corrected 4,185 and improved 5,890.

EXTRACTS FROM THE CASE BOOK OF A SPEECH THERAPIST. By M. FERRIE. London: *Speech*, The Journal of the British Society of Speech Therapists, 2:30-38 (July) 1936.

Ferrie describes the therapeutic technique employed and the results obtained in seven phoniatric cases received at a charity children's hospital speech clinic. The types described were rhinolalia aperta organica, paralalia prolongata, paraphemia prolongata, pararhinosigmatalalia, and three cases of spasmophemia.

THE QUALITY OF A SPOKEN VOWEL. By J. W. BLACK. Iowa City: *Archives of Speech*, 2:7-27 (July) 1937.

Black concludes that resonance must be an operating factor and believes it probable that it affects the strength of the fundamental. One individual seems to have sufficiently established physiological patterns to have considerable constancy in repeating approximately duplicate vowels; which is a factor of considerable importance to phoniatry and to the validity of the sampling method of experimental phoneticians. The three centroids of energy in the sound of *top* (probably [a]) must allow considerable latitude in the frequency bands, being about 200∼, viz. 670-850∼, 1100-1300∼, and 2400-2600∼. This variation in frequency, or polyphthongal quality of the vowel, raised several questions of phonetic theory.

THE CLOSURE OF THE NASOPHARYNX. By D. BROWNE. London: *Speech*, The Journal of the British Society of Speech Therapists, 2:15-20 (July) 1936.

The sphincter of the naso-oro-pharynx is a passage of large calibre which is open for the most part but not only capable of being open and shut but also has sufficient muscular and nervous control to open to any desired size. Its movements can be instantaneous. Closure is brought about by two overlapping slings of muscle rather than a simple ring. These two muscles are the levator palati and the superior constrictor. These two antagonistic muscles have separate nerve supply and the muscle action is through co-contraction. Passavant's ridge results from an upward movement brought about by the action of the palatopharyngeus. Thus as a nasal catheter dangles into the oropharynx, it will be ejected from the nose a quarter

of an inch by the action of this muscle. The few fine fibers reflected from the superior constrictor that completely encircle the sphincter may determine nicety of adjustment. Wardill was the first to designate this opening as a sphincter. The proper technique of surgical closure of cleft velum demands that the velar sphincter be completely without tension and held there during healing. The tendon of the tensor palati turns around the hamular processes which are broken in the typical present day operation.

CLINICAL SPEECH PATHOLOGY IN HOSPITALS. By B. BRYNGELSON (University of Minnesota Department of Pediatrics). *Hospitals*, April, 1937.

The Speech Clinic of the University Hospital at Minnesota University is staffed by the Director (Bryngelson) and a full-time assistant who is a graduate in pediatrics and speech pathology. Various types of disorders are treated: dysarturias, dyslalias, and dysphemias. The Speech Clinic service includes giving lectures and clinical demonstrations to junior medics and interns in pediatrics, and there is a course in speech pathology for graduate doctors in the department of otolaryngology. The Speech Clinic also supplements the clinical material of the academic clinic for education majors.

PITCH AND INTENSITY CHARACTERISTICS OF STAGE SPEECH. By MILTON COWAN. Iowa City: *Archives of Speech*, Supplement, pp. 92, (December) 1936.

This is the most extensive collection of phonophotographic graphs published by the laboratory at Iowa. There are 32 pages of plates giving pitch and intensity inflections of dramatic selections by New York artists. These graphs are fully described and alnayzed in the text. Further value is lent to this study by the possibility of procuring from New York a phonograph record of the selections from which the studies were made. Cowan found that the average pitch range was two octaves, the median pitch level was 141 cycles per second for males and 233 cycles for females, the average standard deviation of syllabic power was 5.9 db., 52% of the speaking time was phonated and in a single pharse continuum phonation comprised 72% of the time, the average speech rate was 157 words per minute, most inflections were falling, rising inflections initiated most phrases, and falling inflections concluded most phrases.

PROBLEM CHILD OF PROBLEM HABITS. By L. B. HOHMAN. Langhorne, Pa.: Proceedings of the Third Institute on the Exceptional Child of the Child Research Clinic of the Woods Schools (*What Science Offers the Emotionally Unstable Child*), pp. 16–30 (October) 1936.

"The ability to talk and walk early makes possible the early development of independence and the cultivation of this independence. An acute auditory apparatus may make the child more sensitive to noises and therefore more easily aroused to fear responses.

The environment may easily over-protect this type of child, thinking that it has an unduly fearful and sensitive child. The psychology of the past and even the present has regarded human behavior as excessively complicated and mysterious. This psychologic prejudice tends to make us overstress heredity and congenital dispositions. These attitudes are a hindrance to understanding and training. Habit sets which can be integrated and disintegrated explain much more than we formally thought. Fortuitous conditioning explains much of behavior. Emotion patterns can be handled like any other behavior patterns. Children have sets of problem habits rather than problem personalities."

THE INFLUENCE OF EMPHATIC RESPONSE ON FREQUENCY OF STUTTERING. By C. VAN RIPER. (in Travis—Studies in Clinical Psychology). Princeton: *Psychological Monographs*, 49:244-246, 1937.

When stutterers attempted to pronounce words which had just previously been pronounced by a normal speaker or bad stutterers, they stuttered more frequently in the latter situation. Certain stutterers seemed to stutter in a manner very much like that used by the pronouncer, although they claimed never before to have stuttered in such fashion. Other suggestible cases seemed to vary the duration of their spasm according to that had by the stuttering pronouncer in pronouncing the words. It should also be mentioned that only sixteen cases were used because of the fact that many stutterers had no difficulty when pronouncing words after they had been spoken. The results are attributed to the effect of the emphatic response to such stimulation.

SOME EMOTIONAL FACTORS AFFECTING CHILDREN'S SPEECH. By N. SEARL. London: *Speech*, The Journal of the British Society of Speech Therapists, 2:21-29 (July) 1936.

A phonetic ramification of a spychoanalytic philosophy is propounded: "The difficulties affecting the oral and respiratory activities of speech have a previous history in the earliest oral and respiratory form of expression of difficulties by means of sound, but before this connection takes place, the child has sought other and less immediately painful ways of the expression of such difficulties. He generally returns at times to the earliest form, with his difficulties sometimes increased by such attempts, and is ready to take still other ways if he can find them. The expression of his trouble in the closely allied activity of speech seems, then, to be not only determined by the severity of the original screaming fits, but also by the painful results of attempts to express them in other and rather more remote ways, as well as by some very painful effect on the child of the speech of other people. Among other effects of emotional factors, we can easily see that articulation, e. g., the choice of consonants, may be affected by the attempt to keep speech free from the more deep-seated sounds of emotional disturbance as compared with the more fronted sounds of happy lalling and cooing." Case report.

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